WA-Trans Steering Committee Meeting Notes
January 4, 2007

Attendees:

Member	Association	Representing
Tareq Al-Zeer	WSDOT NW Region Maintenance Engineer	WSDOT
Sam Bardelson	U.S. Geological Survey	U.S.G.S.
Michelle Blake	WSDOT GIS Data Steward	WA-Trans Project
Chuck Buzzard	Pierce County GIS	Local Govt. GIS
Michaellyn Garcia	Census Bureau	US Bureau of Census
Holly Glaser	WSDOT Geographic Services	WA-Trans (GIS Analyst)
Tami Griffin	WSDOT Geographic Services	WA-Trans (Project Manager), Facilitator
Michael Leierer	WSDOT Geographic Services	WA-Trans (Assistant Project Manager/ Technical Lead)
Mac McKay	WA Department of Natural Resources	WADNR and Natural Resource Business Needs
Andy Norton	Puget Sound Regional Council	MPO and RTPO
Ken Stallcup	WSDOT Contractor	WA-Trans Technical Writer
Ian Von Essen	Spokane County GIS	E-911
Pat Whittaker	WSDOT Transportation Data Office	WSDOT Transportation Data Office

Not Attending:

Member	Association	Representing
David Cullom	WA. Utilities & Transportation Commission	Rail And Utility Needs
Kristina Evanoff	Sound Transit	Transit Needs
David Koch	WA Department of Information Service	Information Services Board – Project Oversight
Kathy O'Shea	Country Road Administration Board	County Road Administration Board
Dave Rideout	Spokane County Engineers Office	East side local government
Lurleen Smith	Mason County Public Works	West side local government
Elizabeth Stratton	WSDOT	Freight Interests
Cathy Udenberg	Walla Walla County Public Works	Local Govt. GIS
Tim Young	WA Dept. of Fish and Wildlife	WA Dept. of Fish and Wildlife

- Introductions, Status Questions, Time Tracking, Action Item Review
- Pend Orielle County Update
- Return on Investment County Review
- Agreement Points Work
- Portal Requirements
- Pre-made Maps in Data User Portal?
- Including Alleys and Driveways
- Restructureing Standards
- Re-segmentation of Data (Chuck brought up on behalf of Mike Berman)
- Action Item Review and Close

Introductions, Status Questions, Time Tracking, Action Item Review

There was confusion regarding the rooms reserved both in Seattle and Olympia. Tami will pursue these things.

Jason Guthrie has asked to be let off the steering committee due to increased responsibilities at work but will continue to participate as a partner.

Pend Orielle County Update

Ian is reporting on the work he is doing with Pend Orielle County since that might represent some useful experience in getting a new county up and running with new data. He reported that the group involved in developing data for Pend Orielle County (funded by a U.S.G.S grant) continues to meet with the county and acquire the data. They gave a presentation to the County in November. They presented about discrepancies in the data. One initial response is that "we didn't give you the right data". So even when you think you have the data you may not. They have been focusing on roads mostly right now. Every department maintains data in whatever software format they have. There is no agreement between files of 911 and transportation. 911 put a lot of energy into their file. E-911 asked the group for a letter of support to continue to do things as they have done in the past. The team is Working with their small IS group to get a server for sharing data. They are trying to get standardized on one piece of GIS software. They have to deal with institutional issues or their will be no maintenance. The road file is one of first products. They are currently dealing with a multiplicity of the data and they all have errors.

Return on Investment County Review

This document was developed to be used by counties to justify their involvement in WA-Trans and to show the value of working with WA-Trans and why it should be successful. We need the county participants to be able to validate the results. Thus we are reviewing it. **See Appendix A for a copy of the draft document.**

Tami shared that the overall document calculates the cost of local government involvement in WA-Trans. Additionally those are calculated over 20 years with inflation included. We will discuss this document at the next meeting. We can only rely on what information is given us. If we have more to go on we will refine and improve these calculations.

Chuck provided significant feedback on the document. He felt that the WA Emergency Management Division (EMD) may be able to give a better idea of what it takes to put the data together in a regional emergency. There were 12 counties provide data to EMD for the recent west-side floods. The provided data and past information and EMD provided it to FEMA. We need a contact that could give us this information. We have had real difficulties getting support from EMD.

Chuck feels these are says really low estimates. He specifically referred to the regional emergency incident data. For the recent floods they send up a helicopter to gather data and the bill for that alone was really high. It was pointed out that we need to focus on WA-Trans role of providing transportation data and as a base map for other data. Any estimates from the recent flooding need to consider that. It would be VERY useful to have those estimates, none-the-less. They had four people working on the recent floods for a week. Chuck will check with Linda and see if he can get us some real data.

Ian shared that EMD there may have an interagency agreement for providing data. All counties and cities will provide services as requested. EMD just wants to see a map. Ian can document costs associated with providing GIS support when they request. He will see about the ones that have reimbursement.

Chuck also asked about the $6000 for city border maintenance. They are constantly working on annexations. It turns out they calculation is $60,000, no $6,000. They do a lot of boundary management. The benefit comes from not having to do the roads that are in the neighboring county.

Michaellyn said that resolution of annexation useful to Census. She also shared that she thinks our estimates of how many counties don't have data may be too high. Our numbers come from CRAB. Now she agrees we still may have to do a tremendous amount of work on the data to make it really useful. We may need to modify that downwards a bit.

Ian is also collecting data regarding working with the Depts. Revenue.

Action Items **–**

- Chuck will check with Linda regarding costs for the recent flooding that may be pertinent to WA-Trans and also boundary annexation work
- Ian will provide Department of Revenue information and information about providing data to EMD by contract.
- Ken will correct math errors in the document.
- Tami will evaluate the numbers of counties requiring data based on what Michaellyn shared.

Agreement Point Work

Draft Document on Agreement Point Options

Andy provided Tami with a draft document regarding different options for dealing with differing potential agreement point situations. **This document is in Appendix B**. Andy reported that Holly and Andy found during work on translation to PSRC format from WA-Trans data format is that while in the pilot King and Pierce County have successfully agreed on the geometry of where data sets have joined it is possible (maybe likely?) that other counties won't be agreeable on boundary locations.

In Andy's opinion what this means in our pursuit of output translations is that we need to consider methodologies to determine a geometric location for agreement points for each translation based on the needs of the user jurisdiction. Andy noted a couple of potential methodologies. We should be able to come up with enough conflation methodologies to satisfy output needs. For example: if a jurisdiction needs to output a piece of road network along a boundary they could specify that their own geometry for agreement point locations could be snapped to. The user requirements for portal impacted here.

WA-Trans format specifies data for points along a boundary and points a logical connection. WA-Trans is not a network until an output translation is done. The output process doesn't need to do anything if parties agree and agreement points are implemented between boundaries.

Ian - A lot of times counties can agree to a point. But they don't want to agree to the cost of moving the data. We need to consider grants to help motivate counties.

Andy's ideas should be seriously considered and Michael will update the data user portal requirements to allow for this to be implemented if it is deemed the best solution.

Action Item – Michael will work with Andy to document this for the portal requirements.

Report on Agreement Point Implementation (King and Pierce Counties)

Diagrams provided by Holly are in Appendix C. Holly reports the accuracy limits (0.01) are so fine that we are running into some artifacts created by the software and geodatabase.

Puget Sound Regional council identifies some other county connections not represented because it isn't part of King and Pierce County business needs. (ex. Proposed roads, proposed rail). Regarding this light rail doesn't cross the county boundary for about 15 years. Pierce always planned to get a statewide rail network from some other agency. But it hasn't been delivered. There are relationships of modal changes now we haven't tried to test. Tami shared about when we add additional modes she is looking at that for and wants to integrate in Puget Sound Pilot assuming we DON'T get funded for adding Snohomish and Kitsap Counties. That would have to be on the cheap and with the same team.

Holly identified issues with resolution in ArcGIS when it comes to finding the closest segment to a point. Clipping in the Pierce and King county polygon created tiny segments. She could chose whole segments on either side of the boundary and connected them but then data is lost. She wants to know which ones connect so she can run an automated check on them and make sure they connect. Chuck said we shouldn't be clipping. Holly is clipping road segments to a polygon to connect them to an agreement points. It appears that King County did not clip to their agreement points.

The issue is not that we have tiny things crossing the line, it is the fact that the resolution we are working at is far beyond the resolution of the original data. It doesn't make any difference. Use a 1 foot resolution for connecting road segments.

If Holly has a segment from Pierce that extends into King County you should just be able to snap that line to an agreement point. Chuck is thinking we have to do that in 9.2. We can get a copy and do this. It is a big jump. Michelle will have to do a lot. Database has to be in place. That is an issue because the only database available requires permission for us to use it.

Portal Requirements

A JAD session was held in Pendleton, OR for the One-Road Pilot. The scope was gathering user requirements for building screens for the data provider Internet portal and data user Internet portal. We want specifications for both portals. Michael provided a Use-Case. A Use-Case can be considered a recipe describing the whole process. This includes what the user can do, what happens and what happens when something goes wrong.

Michael provided an example of a use-case includes a mock-up of the page. If you look at this and read the use case you can see how that works. **See Appendix D for this Use-Case.**

We will be sending these out for feedback with the PAC. Everyone felt Michael's document looked good.

Pre-made Maps in Data User Portal?

One of the items brought up during the JAD session in Pendleton was providing pre-made maps. We need the steering committee to discuss and determine whether we want this in the scope or not.

Chuck said this was a bad idea. Who is going to produce the cartography? There are other much better products. That is not a goal of WA-Trans.

Michelle suggested referring them to The National Map (TNM). There are other products that could be used for this.

Pat reported the Functional Class maps are available online as PDF. How would you decide what is on a pre-made maps? There are too many choices to make. It would take a lot of overhead and resources.

Holly suggested a link to map sites. The interface Michael showed in his Use-Case identifies links to maps.

Ian said that besides making data available if you want to have an IMS site out there where maps can be generated this might take care of that.

Andy asked if there is an issue with the storage format possibly not supporting map creation? Michelle shared that we need other layers and we aren't ready to do it.

Other links (Chuck) may not include WA-Trans data. (Ian) we should include how often we (WA-Trans) updates TNM.

Decision - At this time it not in the scope of WA-Trans to directly support maps and mapping services. Links will be provided to send a user to other facilities. Any links that lead to data provided by WA-Trans will be noted along with timing of the latest WA-Trans update.

Including Alleys and Driveways

We are discussing this because we know some data sets we get will include both alleys and driveways. We know that emergency management needs these. However, Tami started these notes by sharing that if we decide to implement them, they will be a low priority because we have too many other critical things to do.

Michaellyn reported that Census may or may not have alleys and driveways. If it looks like a road it may be picked up but it might be an alley since they use ortho-photos for a lot of their data development. Andy asked how it would affect TNET if the decision is not to include driveways we would use the second order point.

Ian - maybe we can work classification and keep is there but separate. Cities may want to keep alley networks. Removing alleys is not a simple issue. Pat said driveways are considered private roads in some schemes. Chuck said if the decision is not to remove them but to classify them as such then we can make the decision. Private roads need to be classified separately. A driveway is not addressed. An alley doesn't have an address (city of Tacoma does address some of them). WA-DNR forest roads are subject to closure. By Federal definition if you close the road it becomes private.

Decision: Provide a classification including private roads, alleys and driveways. It would be helpful if WA-Trans had a definition of each of those.

We can start with Pat's definition of private road. At the next meeting we can discuss definitions. Michaellyn shared that MTFCC will have those. We could marry those two as a starting place.

Action Items:

- Michael and Pat will work on a draft classifications and definitions for the next meeting.
- Tami will make sure it is on the agenda.

Restructuring Standards

Michael has been updating data characteristics part of the standards. The data characteristics have been changing as the database changes. He felt like it would help use of the standards to make some significant format changes. So he made them and we want feedback on them. There are three documents.

He pulled the data characteristics standards out of the original document. He called it Data Characteristic Standards (**see Appendix E**). He added page 4, 5 & 6. Those pages document the minimum attributes. What is the absolute minimum? Michael took a shot of this. He used the crosswalk spreadsheet used for translation purposes. We need feedback on these.

Chuck likes the whole idea of this. When people look at the overall document it is overwhelming. Most people that have GIS and have an LRS they have heard about this. It is much smaller.

A Metadata Standards Document (**Appendix F**) added minimum required metadata. The JAD identified a data provider profile as part of the Data Provider Portal that gives us a place to go to get some information about the provider. A lot of that is elements that should be in a metadata file. We can use this profile to complete the metadata file. At what point do we say we need more metadata? We need to change the nomenclature for the overall metadata standards. Ian said a wide range of providers are being interacted with. When you are setting up the crosswalk tables you will have to meet with them to fill in missing pieces of metadata. Afterwards the county would have to agree to use the developed metadata.

Chuck - Looks like number 8 is in the first version and not on the second and 9 vise versa. Michael identified some things that he might have missed. Tami suggested that we re-order this document so the required minimums are in the front. It was also suggested that we use a table form for the required, have an additional table for desired and then put the WAGIC GIT standards as an appendix.

Data Standards Document (**Appendix G**) we need to add technical issues with agreement points which would add standards. We know a lot more. Section 4.1 rules for submission changes as a result of new knowledge and data user portal. Definitions in section 2.0 have been updated but they need to be checked and feedback provided. We need to add to stewardship information.

Decision - The breakout is supported.

Action Items:

- Michael update standards as discussed,
- Steering Committee read proposed minimum attribution and definitions and provide feedback.

Re-segmentation of Data

Chuck brought up an issue at the request of Mike Berman of King County Metro, who is working with us on the Puget Sound Pilot. In the original processing of the files we had talked about how E911 needs to address intersections along an interstate even when there isn't an at-grade intersection. E911 software is only able to work with segmented data that is broken at such intersections.

King County does not segment in this way. Pierce, WSDOT, and the US Census Bureau do make a habit of segmenting data at overpasses. The Census Bureau does this since highways tend to serve as boundaries for census blocks. The WA-Trans business rules currently require segmentation only at at-grade intersections.

Mike does not want segmentation altered in the WA-Trans rendition of King County data unless there is a process to track segmentation changes and allow translation back to the originally provided segmentation.

Andy Norton asked if such intersection addresses couldn't be associated with point locations. Michelle thinks that perhaps a second order point can handle this situation, allow for multiple descriptions of existing segmentation, and, through extra processing, even produce desired segmentation upon translation for E911 purposes. This depends on the prevalence of the situation and the information we are provided, though. Chuck added that creating the intersection points is a simple process that could be included upon translation for E911 use.

Perhaps the WA-Trans segmentation rules need to be changed. Andy shared that segmentation at overpasses negatively affects network analysis use. Michele feels that if we need to make changes to the segmentation rules, we will need to add attribution to identify at-grade intersections to support network analysis use of the data. If we decide to change the segmentation rules, perhaps it would also be helpful to capture the crossing order of overpasses too.

Some ideas to explore to solve this issue:

- Michelle suggested that we talk to the other providers and see how they are handling this situation. Ian thinks that we need to spend more time researching among ourselves before we ask the partners for input. There are many different segmentation techniques.
- Chuck suggested that we say that "WA-Trans is going to store segmentation as described in the WA-Trans Standards documents, and this may differ from the provided data's segmentation scheme." WA-Trans will ensure that address ranges are not duplicated. The data provider and user will need to accept that the segmentation has been altered.
- Andy and Michelle think that we should look into other potential solutions, like adding address points, and exploring how we may be able to use these to provide the desired E911 data.

We do not have a resolution for this segmentation issue at this time. We need to do more research. WA-Trans still needs to tackle segmentation on data for the Puget Sound Pilot. Your input is needed.

Action Item – Inform the WA-Trans Project what you know about segmentation over overpasses, etc. and provide input about segmentation schemes and options.

Next meeting and Action Item Review

The next meeting is schedule on April in SPOKANE (not Olympia as Tami stated at the meeting). The Shamen room has been reserved in Olympia (for sure) and room 3B in Seattle. We will see you all there.

Appendix A – WA-Trans and County Roads Business Case

Providing GIS to Washington Counties

What is WA-Trans?

The Washington Transportation Framework Project (WA-Trans) is in the process of building a unique, single-point source for a seamless, comprehensive, updateable road-centerline data set to be used in GIS systems and applications for the state of Washington and border counties in adjacent states. There is no other single source for the data that WA-Trans is designed to provide.

WA-Trans data comes primarily from county and city governments, who have the closest relationship to the infrastructure and generally have the most accurate and timely information. The framework also includes state highway data from WSDOT GIS, data from the county road log (Mobility) of the County Road Administration Board (CRAB), US Census Bureau data, tribal land and US Forest Service data and data from any other reliable source. In cases where jurisdictions are lacking or deficient in electronic road data, other sources will be used to 'fill in the gaps' where possible.

The WA-Trans Project Scope includes support for a GIS linear referencing system. This means that items and events along the roadway can be more easily and more precisely located with reference to street addresses, highway mileposts, and geographical coordinates from GPS and survey data available from WA-Trans partners. The database will eventually include rail, waterway, airport, seaport, and non-motorized route information as well.

Thus, the WA-Trans database will be a comprehensive repository of the best transportation data available for the state of Washington and its constituent jurisdictions. Data from partners will be integrated into the database on a regular update schedule or more frequently if significant changes occur. Data users will be able to log in from their offices and download the most current interjurisdictional information available either through regular updates or on an as-needed basis.

WA-Trans data will be received and distributed via the internet. Both contributors and users will be linked to WA-Trans through a translator that converts data from the local database format to the WA-Trans format and vice versa. Translators will be built once and can be used for as long as the database structures remain the same.

Transportation GIS for County Governments

Currently, there are estimated to be 18 small to medium counties (population under 100,000) that do not have transportation GIS. One large urban county is also without GIS and depends upon commercially purchased data for most of its geographic information needs. There are 16 small to medium counties who have GIS but do not have their CRAB (see below) data integrated into it.

One result of building the WA-Trans database framework and gathering data will be to provide GIS capability to individual counties that do not already have it, and to enhance GIS capabilities for those counties that do have it. This will upgrade transportation data for most of the counties in the state and will confer huge savings over the counties having to develop these capabilities individually.

Building Transportation GIS Capability for Small and Medium Counties

One small county is in the process of building a Roads Layer from scratch. GPS data collection was begun in 2001 and completed in 2004. The cost was about $75,000 in staff time and $25,000 in equipment. Building the Roads Layer from this data requires applying the County Roads Linear Referencing System (LRS, milepost range) and Street Address Ranges. The estimated cost of completing the entire project is $150,000.

Taking the $150,000 figure as an average cost of developing street centerline spatial data and linear reference system for the 18 small/medium counties (population under 100,000) currently without GIS, the total cost of building these systems would be $2.7 million in 2006 dollars.

Building Transportation GIS Capability for a Large County

There is currently one urban large county in Washington that doesn't have locally created GIS transportation data. When they need county road data they often purchase it from a commercial source. The data is often out of date and may be inaccurate. This data cannot be easily shared and cannot be updated.

Building a GIS system for this county would be considerably more expensive than building one for a smaller one. The current (very conservative) WA-Trans estimate for this project, if undertaken separate from WA-Trans is $500,000.

Counties with GIS but No Mobility Data in Their GIS

The County Road Administration Board (CRAB) provides statutory oversight of Washington's thirty-nine county road departments. CRAB is responsible for distributing the counties' portion of the Motor Vehicle Fuel Tax (MVFT). The agency is the custodian of the county road log (Mobility), a database of over 40,000 miles of roads. The formula for the distribution of fuel tax revenues is updated biennially to reflect statewide changes in population, costs, and mileage.

It is the responsibly of each county to report updates of their county road system to CRAB. Currently, county data reported to CRAB is not GIS data but is standard relational database data. The integration of Mobility data into a GIS database allows counties to associate GIS characteristics with the roadway information in the Mobility system. They can then integrate their transportation planning and funding with their standard transportation GIS used for emergency management and other purposes.

One county recently completed the creation of a linear referencing route system using CRAB data. (County routes with Mobility database asset and event data). Their estimated costs were:

- QA/QC county roads for road direction and joint ownership issues = $5,000
- Extraction of asset and event data from Mobility database = $10,000

There are 16 counties that have GIS, but Mobility Data is not part of it. The WA-Trans project will facilitate conflation of Mobility Data with the local GIS data and assign attributes to it. Assuming that the above cost as an average across the 16 counties, developing Mobility Attributes for each of these counties would cost approximately $15,000 per county, a cost that will be eliminated by WA-Trans.

Ongoing Benefits

With GIS databases in place, counties will be able to use their local databases for their own purposes. At the same time, for interjurisdictional needs, e.g. construction projects at the county line, annexation of county roads by cities, regional emergency management, they can download the data they need from WA-Trans and integrate it with their own… 'zooming out' as it were, from their local data.

Basically, WA-Trans will confer significant benefits on counties in providing extra-jurisdictional data (whether from adjacent counties or from state or city sources) for planning and projects, and for distributing data to state and federal agencies as required by law. In addition, counties will realize savings in providing current, updatable, data for construction projects without having to rely on contractors to gather the data (then throw it away. They will be able to use WA-Trans for county planning affected by regional considerations, e.g. functional class across county and city boundaries, the determination of transit routes and schedules etc. Finally, those counties that share a boundary

with Oregon (eventually with Idaho and possibly even British Columbia) will be able to take advantage of the same data-sharing processes as those within the state since Oregon counties will be able to interface with the WA-Trans data base in the same way as Washington Counties.

The tables below list the activities identified to date that will benefit from the development and use of the WA-Trans framework. The first table contains the one-time benefits that counties will realize with the development and implementation of WA-Trans. The second table identifies the long term savings to be realized as the WA-Trans Framework becomes an integral part of doing business in Washington State.

WA-Trans One-time Benefits to Counties for 2008 and 2009

Activity, task, project	**Est. No. of Counties**	**Est. No. of Incidents/yr**	**Est. hrs @ burdened rate, or cost per incident**	**Total savings for counties in Washington**
Savings to the counties that will be relieved of the cost of individually developing street centerline spatial data and linear referencing system. (source Lincoln County)	18 small/med. counties (population under 100,000)	One-time benefit	$150,000 per county	$2.7 million
Savings to one large urban county that will be relieved of the cost of developing street centerline spatial data and linear referencing system. (estimate)	1 large county	One-time benefit	$500,000	$0.5 million
Savings to the individual counties that will be relieved of the cost of developing Mobility attribution for counties that already have GIS but no mobility data. (source Mason and Walla Walla counties)	16 Counties	One-time benefit	$15,000	$240,000
Total cost savings to Washington counties for the development of GIS capability				**$3,440,000**

WA-Trans On-Going Annual Benefits to Counties

Activity, task, project	**Est. No. of Counties**	**Est. No. of Incidents/yr**	**Est. hrs @ burdened rate, or cost per incident**	**Total savings for counties in Washington**
Eliminate county transfers of data to city governments. (source Walla Walla County)	29 med/large counties	12 transmittals/ yr	1 hr/transmittal =348 hrs/yr @ $60/hr	$20,880
Savings to Local Governments: Reduce street data collection costs charged by contractors for various projects.	45 local govts	3 projects/yr	$5000/yr	$675,000
Savings to cities and counties: Automate point placement (geocoding) by contractors. (source CH2MHill)	45 local govts	2 projects/yr	$1200/project	$108,000
Savings to cities and counties: Minimize the need for contractors to assign road attributes and cost values for routing projects, and improve route analysis efficiency. (source CH2MHill)	45 local govts	1 project/yr/ county	$3300	$148,500
Minimize county transfers of data to state and federal agencies.	10 small counties	20 transmittals/ yr	1 hr @ $30	$6,000
Minimize need to develop border state (Oregon, Idaho) centerline data for various maps.	7 small counties	10 maps/yr	3 hrs/map @ $30	$6,300
Reduce map development and maintenance requirements for the new Washington/Oregon Regional Transportation COG.	2 small counties	ongoing maintenance	24 hrs/yr/county @ $30	$1,440

For dense, fast-growing counties (King, Pierce, Snohomish, Clark and Spokane): Minimize the need to gather data from neighboring local governments to support regional business needs. (source King County)	5 large counties	ongoing maintenance	40 hrs/yr/county = 200 hrs/yr @ $60	$12,000
For dense, fast-growing counties (King, Pierce, Snohomish, Clark and Spokane): Minimize the need to maintain border City data. (source King County)	5 large counties	ongoing maintenance	200 hrs/county = 1000 hrs/yr @ $60	$6,000
For dense, fast-growing counties (King, Pierce, Snohomish, Clark and Spokane): Minimize the need to edge-match to bordering counties. (Source King County)	5 large counties	ongoing maintenance	340 hrs/county = 1700 hrs @ $60	$102,000
Savings to Local Governments: Reduce time to compile regional incident maps - 20 local government incidents per year * $1400 per local government incident = $28,000 (in 2007 dollars). (source - Mason and Walla Walla counties)	potentially all counties	20 local government incidents/yr statewide	$1,400/incident	$28,000
TOTAL ANNUAL SAVINGS TO COUNTIES				**$1,114,120**

Appendix B – Draft Agreement Point Options

Outline of Procedure for use of Agreement Points

Agreement points represent logical connectivity not physical location

--But for the purposes of the Pierce/King Pilot recommend enforcing coincidence of agreement points on input to the WATRANS geodatabase (using tolerance, grid size and extent) for each pair of segments connected by point for which that point's geometry will be used for the agreement point. This is because King and Pierce have already specified this geometry.

Physical location of the final 'snapped' node determined by one or more conflation methodologies, for examples:

--no snapping
--requestor jurisdiction physical locations take precedence
--boundary survey physical locations take precedence
--previous understanding snapping methodology applied
--rubber sheeting process used with specified order

Issues will include possible change in feature count—affecting comparison to the WATRANS data, and changes in geometry (at boundaries and beyond, depending on methodologies above)

Conflation methodologies used on output translation

King/Pierce pilot unique in that understanding previously arrived at specifies physical location of Pierce agreement point to be snapped to.

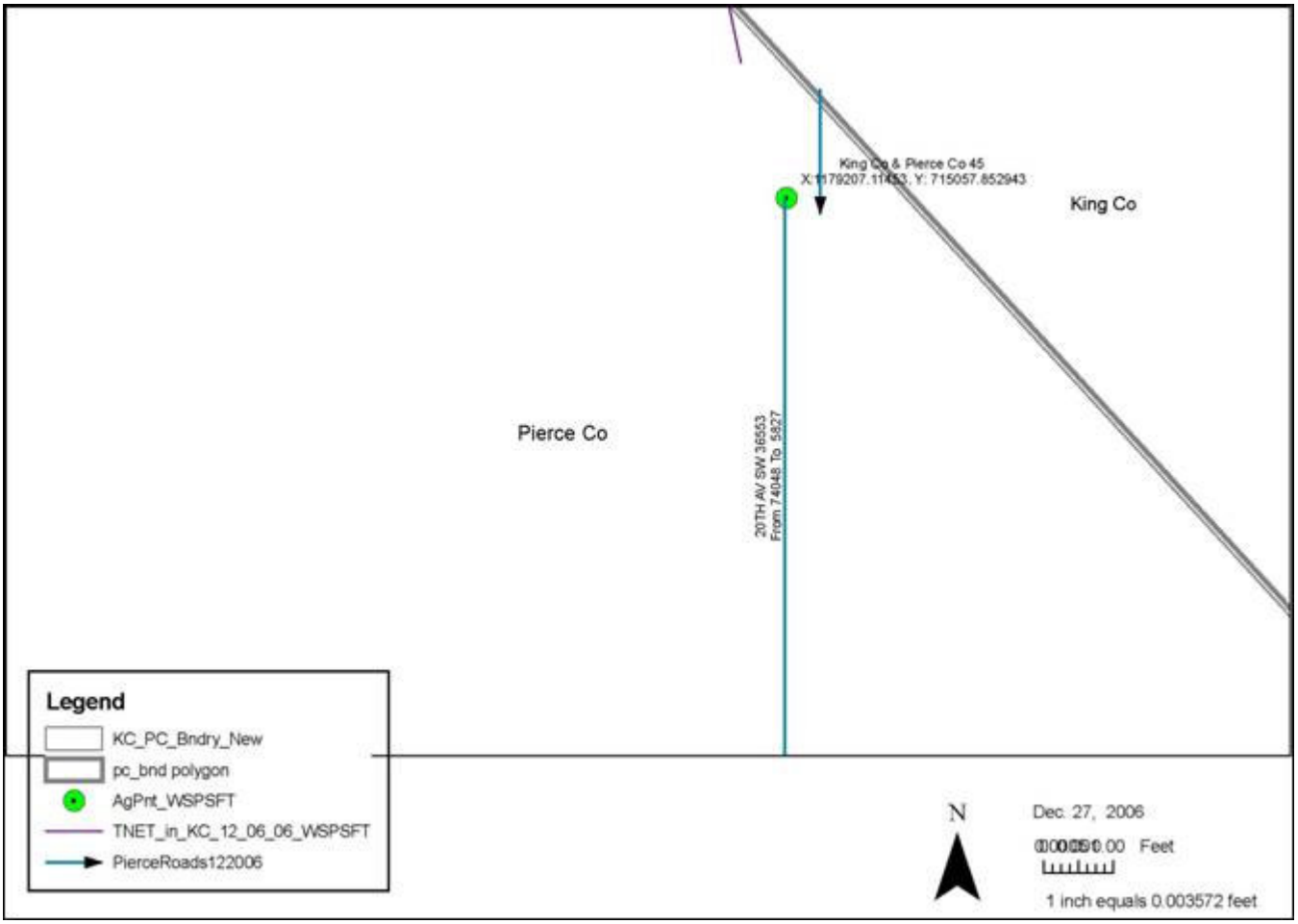
Appendix C – Agreement Point Illustrations

Short Segments

ArcGIS can create a short segment when clipping road segments to a polygon.

This can result in having more than one segment near to an agreement point.

The segments that meet at an agreement point should be specified.



Additional Diagram can be provided upon request.

Appendix D – Data User Portal Use-Case Example

USE CASE # 1	Data User Home Page
Goal in Context	Define use and functionality of Data User Home Page
Scope & Level	User
Preconditions	User is connected to the Internet
Success End Conditions	Data User Home page is open and all links are functional.
Failed End Conditions	1. Data User home page does not open 2. Not all functions are operational
Primary Actors	First Time Data User, Casual User, Veteran Data User
Secondary Actors	Anonymous User
Trigger	User enters URL or clicks a link to the Data User Home page

Description

Step	**User Action**	**System Action**
1	User enters the WA-Trans Data User Home page URL, or clicks a link to the Data User Home page.	
2		1. WA-Trans Servers display the Data User Home Page over the Internet. 2. The server will paint a county in the Map "Gray", if within the last 30 days their newest data has been updated to WA-Trans Production.
3	User hovers over the Washington state Map using the mouse.	
4		As mouse passes over each county, text appears listing the Date the most recent data submitted to WA-Trans, for that county, was placed into production. If no data exists for that county this information will also be given.
5	A Veteran User enters the User Name in the User Name Edit box.	
6	A Veteran User Enters Password in the Password Edit box.	
7	A Veteran User Clicks the Logon Button	
8		System checks user with data records: 1. Is the User Name in the records? 2. Is the password correct?
9		For successful Login the system will display a different page allowing search and advanced data retrieval processes (See Get Data Use Case), exits Data User Home page. (See Extensions 8.1 for errors with the login)

10	User clicks the "I am Interested in Providing Data" Link	
11		System opens form, which allow user it enter information and send this information to the WA-Trans Administrators. (See New Data Provider Use Case) Exits Data User Home page
12	User Clicks on "WA-Trans Project" link	
13		System opens WA-Trans Project Internet site. Exits Data User Home page.
14	User Clicks the "Contact Us" link.	
15		System opens Email and places the Email address of the WA-Trans Administrator in the Email address box of the users default Email. Data User Home page remains active.
16	User Clicks a link in Top Menu Bar	See Menu Bar Use Case
17	User Clicks a link in the Left side Menu List	See Menu List Use Case

Errors / Extensions

Num	Action Num	Action
1.1		User cannot access application
	1.1.1	WA-Trans administrators will need to be informed. Help Information previously provided to user may assist by giving contact information.
2.1		System cannot obtain information about recent updates to WA-Trans production.
	2.1.1	The Get Data Washington State Map will not display any counties in "Gray". Only counties who have had data updated to WA-Trans production in the last 30 days will be painted "Gray". This event may be an error, but it is possible that no counties will have any data updated to WA-Trans production within the last 30 days, at the time the Data User Home page was accessed.
4.1		System cannot find text to display as mouse hovers over counties in the Get Data Washington Map.
	4.1.1	No text will be displayed. This is an error and needs to be reported to the WA-Trans Administrator. There should be text displaying the most recent update of counties data to WA-Trans production for each county. If no data has been placed into production for a county this should also be displayed in text during the hover function.
8.1		System cannot determine security information based on either the Logon ID or the Password for the information entered into the User Name or Password text boxes.
	8.1.1	The User Name cannot be found in the WA-Trans database. The User Name and Password Edit boxes are cleared of data. A message is returned to the Data User Home page informing the user that "Your User Name cannot be found, please enter your User Name again".
	8.1.2	The Password is not correct for the User Name entered in the User Name edit box. The User Name and Password Edit boxes are cleared of data. A message is returned to the Data User Home page informing the user that "The Password is incorrect, please enter

		the User Name and Password again."
11.1		When the user clicks the "I am Interested in Providing Data" Link nothing happens
	11.1.1	This is an error and needs to be reported to the WA-Trans administrator.
13.1		When the user clicks the "WA-Trans Project" Link nothing happens
	13.1.1	This is an error and needs to be reported to the WA-Trans administrator.
15.1		When the user clicks the "Contact Us" Link nothing happens
	15.1.1	This is an error and needs to be reported to the WA-Trans administrator.

Related Information	
A	This page provides no functionality to obtain data and is meant to provide information about WA-Trans and what WA-Trans can provide a user. This page is also an avenue for veteran users to access processes to obtain data. An Anonymous User will need to contact WA-Trans Administrators or access functionality **not yet determined** to obtain WA-Trans information.
B	In general this page is informational and provides access to other pages. The only real application functionality is the Logon Process. Given this the steps under the "User Action" of "Description" section do not represent a begin to end process in this Use Case and except for the logon process can be performed in any order. **NOTE: Generally in a Use Case the steps must be followed in order presented with the exceptions noted in the Error/Extensions section.**

Address T:\WA-Trans_User_Interface_Home.htm

Washington State Department of Transportation

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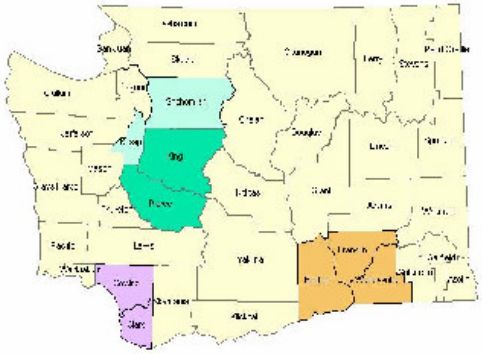
WA GeoSpatial Framework

Washington State Transportation Framework

WA-Trans represents the best transportation data available from various sources, includes mechanisms to improve over time and provides data which can be shared with partners and other organizations at the least cost with the least restrictions.

Get Transportation Data



Veteran Users Logon

I Am Interested in Providing Data

User Name:
Password:
Logon

Forgot Password

WA-Trans Project

Contact Us

Problems with this site? Please contact the webtech.

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Appendix E – Proposed Data Characteristic Standards

Washington State Department of Transportation

WA-Trans Data Standards
Data Characteristics

Created for the Washington State
Transportation Framework (WA-Trans)

Version 8.0

Last Updated: January 2, 2007

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3.0 Data Characteristics

The Washington Transportation Framework (WA-Trans) database is a collection of prioritized, spatially-referenced digital representations of broadly defined transportation feature sets for Washington. The Transportation Framework Theme currently comprises (in no particular order): roads, railroads, address ranges, address points, reference points (nodes), trails, transportation structures, ferries, airports and ports (as points), light rail, and for county road and state highways: traffic volumes, speed limits, federal functional class, surface types, HOV lanes. The content of this document is focused on the essential data elements necessary for the centralized statewide data sets and for the data submitted to WA-Trans from a data provider.

The WA-Trans database is capable of:

- Maintaining data with multiple geometries,
- Storing information necessary to maintain local as well as state Linear Referencing Systems (LRS), E.G. An LRS may be by address range and/or by mile points and both can be maintained,
- Research is ongoing to maintain feature level metadata in the WA-Trans database.
- Maintaining history of transportation framework data.

The following data characteristics outline included attribution for all transportation modes and attribution for specific transportation modes. These requirements are subject to change based on findings during the two pilot projects. An "(R)" before the attribute name indicates a required field for data stewards to provide to WA-Trans. An "(R*)" before the attribute name indicates a required field in specific circumstances as described in the definition following the attribute.

3.1 Minimum Required Attributes (Non-graphic Data Elements)

There are some minimum data attributes necessary for WA-Trans to process submitted data. Some of the minimum data attributes can be checked during data submission. Many of the attributes will need to be present to ensure the data can be initially stored in the Staging WA-Trans database prior to QA/QC processes.

The following table lists the minimum attributes required for data submission to WA-Trans. The first column is the name of the attribute, which is listed in the complete attribute listing at the top of this document. The second column is the data type in WA-Trans. *NOTE: If the provider attribute matches the description in the right column, but is not the same data type the dataset can be submitted without any changes by the data provider.* The Description in the right column is different than the description in the data characteristics tables and is designed to help with translation and data submission.

Attribute Full Name	Data Type	Description
Segment Local Identifier	varchar (9)	This is the identifier the data provider uses to uniquely identify this segment within the locals GIS system.
Segment Length	decimal(10,3)	The linear measurement of the segment from one end point to the other. All measurements will be in US Survey Feet.

Mode Type Identifier	integer (FK)	1 = Road 2 = Rail Line 5 = Bike Trail
Segment Physical Inception Date	datetime	Date road completed and operational.
Segment Physical Create Date	datetime	Date road was built.
Segment Physical Retire Date	datetime	Date road removed from operational use.
Attribute Full Name	**Data Type**	**Description**
Segment Description Local LRS Identifier	varchar (15)	Identifier assigned to Transportation Segment Description by Mode Data Steward (if applicable).Examples: County Road Number, City Street Name (Main St.), State Route Number (005) etc.
Segment Description Begin Milepoint	decimal (6,3)	Milepoint describing the beginning of a segment as it relates to the segment description.
Segment Description End Milepoint	decimal (6,3)	Milepoint describing the ending of a segment as it relates to the segment description.
Segment Description Path Description	varchar (255)	Description assigned to segment that describes the segment circumstances.
Segment Description Local Length	decimal (10,3)	Length of segment. (Might be calculated from milepost data, if not present.)
Segment Description Local Length Measurement Unit	varchar (30)	The rudimentary unit of measure use by the local data steward based on the measurement system they use (e.g. feet, meter, mile).
FIPS Left County Identifier	varchar (3)	Federal Information Processing Standard number identifying the county to the left of the line segment
FIPS Right County Identifier	varchar (3)	Federal Information Processing Standard number identifying the county to the right of the line segment
FIPS Left City Identifier	varchar (5)	Federal Information Processing Standard number identifying the city to the left of the line segment
FIPS Right City Identifier	varchar (5)	Federal Information Processing Standard number identifying the city to the right of the line segment

Segment Description Road Full Street Name	varchar (15)	Identifier assigned to Transportation Segment Description by Mode Data Steward (if applicable).Examples: County Road Number, City Street Name (Main St.), State Route Number (005) etc.
Segment Description Alternate Name Flag	decimal (6,3)	Milepoint describing the beginning of a segment as it relates to the segment description.
Segment Description Road Left Low Address	decimal (6,3)	Milepoint describing the ending of a segment as it relates to the segment description.
Segment Description Road Left High Address	varchar (255)	Description assigned to segment that describes the segment circumstances.
Segment Description Road Left Zip Code	decimal (10,3)	Length of segment. (Might be calculated from milepost data, if not present.)
Segment Description Road Right Low Address	varchar (30)	The rudimentary unit of measure use by the local data steward based on the measurement system they use (e.g. feet, meter, mile).
Segment Description Road Right High Address	varchar (3)	Federal Information Processing Standard number identifying the county to the left of the line segment
Segment Description Road Right Zip Code	varchar (3)	Federal Information Processing Standard number identifying the county to the right of the line segment

Segment Description Road Name Prefix Direction	varchar (5)	Federal Information Processing Standard number identifying the city to the left of the line segment
Segment Description Road Name Prefix Type	varchar (5)	Federal Information Processing Standard number identifying the city to the right of the line segment
Segment Description Road Name		
Segment Description Road Name Suffix Type		
Segment Description Road Name Suffix Direction		
Attribute Full Name	**Data Type**	**Description**
Reference Point Survey Description	varchar (255)	Narrative pertaining to the survey performed on the Reference Point.
Reference Point Location Description	decimal (10,3)	An unambiguous description of the Reference point, which makes it field recoverable. (FW-Location Description).
FIPS County Identifier	varchar (10)	Federal Information Processing Standard number identifying the County where data originated. This data required for terminal or station information.
Reference Point Address	varchar (125)	Street Address. This data required for terminal or station information.
Reference Point Full Street Name	varchar (10)	Full Street Name. This data required for terminal or station information.
Reference Point Zip Code	varchar (5)	Associated Zip Code. This data required for terminal or station information.
FIPS City Identifier		Federal Information Processing Standard number identifying the city Reference Point is identified with.

3.2 Minimum Graphic Data Elements

The Minimum graphic data includes:

- File type, e.g. Shape file, coverage
- Projection, e.g. either Washington State Plane North or Washington State Plane South
- Datum, e.g. NAD1983/HARN

3.3 WA-Trans Attribution

This is the complete attribution for the WA-Trans database. The data structure can be referenced in the WA-Trans Logical Data model with the names in the right column directly related to the names in the model.

3.3.1 Points

Reference Point		The specified location of the (required) points [From/To] of a Framework Transportation Segment (FTSeg), or an (optional) reference point offset along the length of the FTSeg, on a physical transportation system. A zero dimensional object that specifies geometric location. A pair (e.g., "x, y") or triplet (e.g., "x, y, z") of coordinates specifies the location (SDTS). Includes the location of transportation terminals such as airports, train stations and ferry terminals.
Reference Point Identifier	CHAR(36)	Surrogate Key. A GUID generated by database processes upon insertion of a record. Used to uniquely identify a record within the database.
(R) OBJECTID	INTEGER	Identifier applied by GIS Software
(R) SHAPE	INTEGER	Reference to the Geo-Spatial aspects of the data.
Reference Point Survey Description	VARCHAR(255)	Narrative pertaining to the survey performed on the Reference Point.
Reference Point Object Code	CHAR(1)	Object code indicating that a particular piece of data is a point. (FW-part of Trans. Point ID).
(R) Reference Point Location Description	VARCHAR(255)	An unambiguous description of the Reference Point, which makes it field recoverable. (FW-Location Description).
(R) Reference Point Northing	DECIMAL(10,3)	The distance northward of a point from a given parallel indicated by a map grid reference, calculated in US Survey Feet. Can be viewed as the local y coordinate.
(R) Reference Point Easting	DECIMAL(10,3)	The distance eastward of a point from a given meridian indicated by a map grid reference, calculated in US Survey Feet. Can be viewed as the local x coordinate.
(R) Reference Point Create Date	DATE	Date assigned to Reference Point that indicates the date that road Reference Point data was created in the WA-Trans database.
Reference Point Update Date	DATE	Date assigned to Reference Point that indicates the date that road Reference Point data was updated in the WA-Trans database.
Reference Point Validate Date	DATE	Date assigned to Reference Point that indicates the date that road Reference Point data was validated (verified).
Reference Point Retire Date	DATE	Date assigned to Reference Point that indicates the date that road Reference Point data was retired in the WA-Trans database.
(R*) FIPS State Identifier	VARCHAR(2)	Federal Information Processing Standard number identifying the State where data originated. This data required for terminal or station information. WA-Trans is using the FIPS alpha not the FIPS number identifier.
(R*) FIPS County Identifier	VARCHAR(3)	Federal Information Processing Standard number identifying the County where data originated. This data required for terminal or station information. The FIPS county codes are three characters to maintain the leading zeros in the number. These codes are unique only within a particular state.
FIPS City Identifier	VARCHAR(5)	Federal Information Processing Standard number identifying the city Reference Point is identified with.
(R) Reference Point Agreement Identifier	INTEGER	Foreign Key into the Reference Point Agreement Table.
(R) Reference Point Type Identifier	INTEGER	Foreign key into the Reference Point Type table.
(R) Reference Point Data Steward Identifier	INTEGER	Foreign key into the Stakeholder table.

(R) Status Identifier	INTEGER	Foreign key into the Status table.
(R) Horizontal Accuracy Measurement Method Identifier	INTEGER	Foreign key into the Horizontal Accuracy Measurement Method table.
(R) Reference Data Set Id	INTEGER	Foreign key into the Reference Data Set table.

Reference Point Address		Reference Point Address. This allows for address points as well and multiple addresses for a reference point.
Reference Point Address Id	CHAR(36)	Surrogate Key. A GUID generated by database processes upon insertion of a record. Used to uniquely identify a record within the database.
(R) OBJECTID	INTEGER	Identifier applied by GIS Software.
(R) Reference Point Address	VARCHAR(10)	Street Address. This data required for terminal or station information.
Reference Point Address Prefix Direction	VARCHAR(10)	N, NW, S, SW, SE, E, NE
Reference Point Address Prefix Type	VARCHAR(15)	Used to describe the road direction if it is incorporated into the beginning of the road name. N, NW, S, SW, SE, E, NE (e.g. SW Main Street).
Reference Point Address Road Name	VARCHAR(50)	The name of the road
Reference Point Address Suffix Direction	VARCHAR(10)	Use to describe the road direction if it is incorporated into the end of the road name. N, NW, S, SW, SE, E, NE (e.g. Main St. SW)
Reference Point Address Suffix Type	VARCHAR(15)	The type of roadway, as per US Postal Addressing Standards. Avenue, Street, Lane, Highway, Road etc
Reference Point Zip Code	VARCHAR(10)	Associated Zip Code. This data required for terminal or station information.
Reference Point Full Street Name	VARCHAR(125)	The concatenation of the following fields in the order listed: Prefix Direction, Prefix Type, Road Name, Suffix Type, Suffix Direction. This data required for terminal or station information.
Reference Point Address City Name	VARCHAR(60)	The name of the City used in the address. This may or may not be the City identified by the FIPS City Identifier.
Reference Point Identifier	CHAR(36)	Foreign key into the Reference Point table.
Reference Point Airport Identifier	CHAR(36)	Foreign key into the Reference Point Airport table.
Reference Point Ferry Identifier	CHAR(36)	Foreign key into the Reference Point Ferry table.
Reference Point Rail Identifier	CHAR(36)	Foreign key into the Reference Point Rail table.

Stakeholder Reference Point		Indicates the Stakeholder's Reference Point Identifier that is associated with the WA-Trans Reference Point Identifier.
Stakeholder Reference Point Identifier	INTEGER	Surrogate Key. Sequential number auto-generated by the database upon insertion of a record. Used to uniquely identify a Reference Point Type record within the database.
(R) OBJECTID	INTEGER	Identifier applied by GIS Software.
(R) Stakeholder Identifier	INTEGER	Foreign key that identifies the Stakeholder the Local Identifier belongs to.
(R) Reference Point Identifier	CHAR(36)	Foreign key that identifies the WA-Trans Reference Point Identifier the Local Identifier is associated with.
Reference Point Local Identifier	VARCHAR (9)	Identifier assigned to Reference Point by the Stakeholder (if applicable).

Reference Point Agreement		An agreement between two parties, who possess overlapping data sets, and who share data boundaries, over the location of shared map features.
Reference Point Agreement Identifier	INTEGER	Surrogate Key. Sequential number auto-generated by the database upon insertion of a record. Used to uniquely identify a Reference Point Agreement record within the database.
(R) OBJECTID	INTEGER	Identifier applied by GIS Software.
Reference Point Agreement Document Description	VARCHAR (255)	A record that describes the spatial agreement between entities of a feature.

Reference Point Type		Defines the nature of a discrete geographic location. Possible values include: • Jurisdictional Boundaries • Transportation Terminal • Intersection (within a mode) • Multi-Modal Intersection (intersection of one mode with a different mode)
Reference Point Type Identifier	INTEGER	Surrogate Key. Sequential number auto-generated by the database upon insertion of a record. Used to uniquely identify a Reference Point Type record within the database.
(R) OBJECTID	INTEGER	Identifier applied by GIS Software.
(R) Reference Point Type Name	VARCHAR (50)	Code that identifies the type of reference point
(R) Reference Point Type Description	VARCHAR (500)	A description of the type of reference point (as noted above)

Reference Point Mode Order		Indicates the order of the reference point for a particular mode. A reference point may have different importance to different modes. Defines the nature of the point of record:
Reference Point Identifier	CHAR(36)	A GUID from the Reference Point table and used with the Mode Type Identifier is used to identify the Reference Point with a Mode Type
(R) Mode Type Identifier	INTEGER	Part of the Primary Key and is from the Mode Type table that identifies the transportation mode of the point.
OBJECTID	INTEGER	Identifier applied by GIS Software.
(R) Reference Point Mode Order Indicator	VARCHAR(5)	Defines the nature of the point of record: 1st order - a point where a segment is broken; e.g. begin/end 2nd order - point not at the break of a segment, but where there is facility information, specifically public/private road at-grade intersections. Perhaps we can define additional 'orders' for road/rail at-grade intersections, etc. *Note: The same Reference Point can be a different 'order' for different modes. An example is where a bike lane joins a road segment. The point it joins is a first order point for the bike lane as it is the end point for the segment, but for the road, it is a second order point to indicate it is a point of interest, but not a break in the segment.

Horizontal Accuracy Measurement Method		Contains data pertaining to horizontal accuracy and measurement method of a Reference Point
Horizontal Accuracy Measurement Method Identifier	INTEGER	Surrogate Key. Sequential number auto-generated by the database upon insertion of a record. Used to uniquely identify a Horizontal Accuracy Measurement Method record within the database.
(R) OBJECTID	INTEGER	Identifier applied by GIS Software.
(R) Horizontal Accuracy Measurement Method Code	CHAR(3)	A three character code which describes the derivation of the horizontal position and which allows the user to assess the accuracy and precision of the point x and y position. (FW-Horizontal-Accuracy-Measurement-Method).
(R) Horizontal Accuracy Measurement Method Code Description	VARCHAR(255)	Narrative description of the three character code, which describes the derivation of the horizontal position and which allows the user to assess the accuracy and precision of the points x and y position. (FW-Horizontal-Accuracy-Measurement-Method).
(R) Horizontal Accuracy Measurement Method Datum Description	VARCHAR(255)	A description of the datum that was being used during the capture and creation of the original data
(R) Horizontal Accuracy Measurement Method Projection Description	VARCHAR(100)	A description of the projection that was being used during the capture and creation of the original data

3.3.2 Segment Data

Segment		A specified directed path between two Framework Transportation Segment Reference Points along a physical transportation system that identifies a unique segment of that physical system. The NSDI Framework Transportation Identification Standards states that Segments must not span State or international borders.
Segment Identifier	CHAR(36)	Surrogate Key. A GUID generated by database processes upon insertion of a record. Used to uniquely identify a Segment record within the database.
(R) OBJECTID	INTEGER	Identifier applied by GIS Software.
(R) Segment Local Identifier	VARCHAR(9)	Identifier assigned to the Segment by the data steward.
Segment Length	DECIMAL(10,3)	The linear measurement of the segment from one end point to the other. All measurements will be in US Survey Feet.
(R) Segment Create Date	DATE	Date assigned to the Segment that indicates the date that the segment data was created.
Segment Update Date	DATE	Date assigned to the Segment that indicates the date that the segment data was updated.
Segment Validate Date	DATE	Date assigned to the Segment that indicates when that the segment data was validated (verified).
Segment Retire Date	DATE	Date assigned to the Segment that indicates the date that the segment data was retired.
Segment Object Code	CHAR(1)	Object code indicating that a particular piece of data is a segment. (FW-part of Trans. Segment ID).
Segment Length	DECIMAL(10,3)	The linear measurement of the segment from one end point to the other. All measurements will be in US Survey Feet.
Horizontal Accuracy Measurement Method Identifier	INTEGER	Contains identifier that relates to table containing the horizontal accuracy and measurement method used to acquire a Reference Point
(R) Infrastructure Owner Identifier	INTEGER	Code relating to the owner of the physical infrastructure.
(R) Infrastructure Maintainer Identifier	INTEGER	Code relating to the entity responsible for maintaining the physical infrastructure
(R) Data Steward Identifier	INTEGER	Code relating to the entity that is the data steward

(R) Status Identifier	INTEGER	Foreign key into the Segment Status table.
Segment Ramp Flag	BOOLEAN	Indicates if a segment is a Ramp Feature.
(R) Mode Type Identifier	INTEGER	Reference to the Mode Type of this segment (See Mode Type)
Segment Physical Inception Date	DATE	The date the physical infrastructure represented by the segment was operational for use.
Segment Physical Create Date	DATE	The date the physical infrastructure represented by the segment was created/built.
Segment Physical Retire Date	DATE	The date the physical infrastructure of the segment was removed from operational use.
(R) Reference Data Set Id	INTEGER	Foreign key into the Reference Data Set table.

Segment Geometry		Stores the Segment Geometry allowing for multiple geometries within WA-Trans.
OBJECTID	INTEGER	Surrogate Key. Identifier applied by GIS Software upon insertion of a record. Used to uniquely identify a Segment Geometry for a Segment record within the database.
(R) SHAPE	INTEGER	Reference to the Geo-Spatial aspects of the data.
(R) Segment Geometry	LARGE BINARY	Identifier assigned to Transportation Segment Description by Mode Data Steward (if applicable). Examples: County Road Number, City Street Name (Main St.), State Route Number (005) etc.
(R) Segment Identifier	CHAR(36)	Foreign key into the segment table identifying the segment the geometry is related to.
(R) Segment Geometry Create Date	DATE	Date assigned to the Segment Geometry that indicates the date that the data was created.
Segment Geometry Update Date	DATE	Date assigned to the Segment Geometry that indicates the date that the data was updated.
Segment Geometry Validate Date	DATE	Date assigned to the Segment Geometry that indicates when that the data was validated (verified).
Segment Geometry Retire Date	DATE	Date assigned to the Segment Geometry that indicates the date that the segment data was retired.
Preferred Flag	BOOLEAN	Indicates if this is the preferred geometry for a Segment. Other geometries can be included in the database, but will be considered alternatives and not preferred.

Segment Description		Descriptive data pertaining to segments regardless of mode type. Specific descriptive data for each mode is handled in separate mode description tables.
Segment Description Identifier	CHAR(36)	Surrogate Key. A GUID generated by database processes upon insertion of a record. Used to uniquely identify a Segment Description record within the database.
(R) OBJECTID	INTEGER	Identifier applied by GIS Software.
(R) Segment Description Local LRS Identifier	VARCHAR(15)	Identifier assigned to Transportation Segment Description by Mode Data Steward (if applicable). Examples: County Road Number, City Street Name (Main St.), State Route Number (005) etc.
(R) Segment Description Full LRS Description	VARCHAR(25)	The unique identifier of the LRS that assures a distinction between segments that may have the same Local Identifier; e.g. Main St. This field is created by WA-Trans concatenating the following fields together: FIPS State Code (2 characters) • StakeholderId (4 characters ONLY) • ModeId (2 characters only) • Local Identifier (15 characters) *SPECIAL NOTE: This schema requires /assumes the following: 1. The Stakeholder specified WILL be the Owner of the physical infrastructure. 2. Leading zeros will be added to id fields not yet 4 characters long (e.g. 1 becomes 0001, etc.) 3. We will have no more than 3.1. 9999 Authorities; 3.2. 99 Modes The entire structure of this field will be modified if higher numbers are needed

(R) Segment Description Begin Milepoint	DECIMAL(6,3)	Milepoint describing the beginning of a segment as it relates to the segment description, assigned by the Road Data Steward.
(R) Segment Description End Milepoint	DECIMAL(6,3)	Milepoint describing the ending of a segment as it relates to the segment description, assigned by the Data provider Steward.
Segment Description Path Description	VARCHAR(255)	Description assigned to segment by Stakeholder that describes the segment circumstances.
(R) Segment Description Create Date	DATE	Date assigned to the Segment Description that indicates the date the segment description was created in WA-Trans.
Segment Description Update Date	DATE	Date assigned to the Segment Description that indicates the segment data update date in the WA-Trans database.
Segment Description Validate Date	DATE	Date assigned to Transportation Segment Description that indicates the segment data validation date.
Segment Description Retire Date	DATE	Date assigned to the Segment Description that indicates the segment data retirement date.
Segment Description Local Length	DECIMAL (10,3)	A measured length of a segment described by the Length Accuracy Measurement Method Code (FW-Length, T-FIT-Length).
Segment Description Local Length Measurement Unit	VARCHAR (30)	The rudimentary unit of measure use by the local data steward based on the measurement system they use (e.g. feet, meter, mile).
FIPS State Identifier	VARCHAR (2)	Federal Information Processing Standard number identifying the State where data originated
FIPS Left County Identifier	VARCHAR (3)	Federal Information Processing Standard number identifying the county to the left of the line segment
FIPS Right County Identifier	VARCHAR (3)	Federal Information Processing Standard number identifying the county to the right of the line segment
FIPS Left City Identifier	VARCHAR (5)	Federal Information Processing Standard number identifying the city to the left of the line segment
FIPS Right City Identifier	VARCHAR (5)	Federal Information Processing Standard number identifying the city to the right of the line segment
Length Accuracy Measurement Method Identifier	INTEGER	Link to length accuracy measurement table - explains method of data capture
(R) Segment Identifier	CHAR(36)	Foreign key into the segment table identifying the segment this description pertains to.
(R) To Segment Point	CHAR(36)	Foreign key into the Reference Point table that identifies the “TO” Reference Point of a given line segment.
(R) From Segment Point	CHAR(36)	Foreign key into the Reference Point table that the “FROM” Reference Point of a given line segment.
(R) Segment Description Steward Identifier	INTEGER	Foreign key into the Stakeholder table identifying the steward of the data and other related information.
(R) Status Identifier	INTEGER	Foreign key into the Segment Status Table.
(R) Reference Data Set Id	INTEGER	Foreign key into the Reference Data Set table.

Segment Description Road		Descriptive data pertaining to road segments.
Segment Description Road Identifier	CHAR(36)	Surrogate Key. A GUID generated by database processes upon insertion of a record. Used to uniquely identify a Segment Description Road record within the database.
(R) OBJECTID	INTEGER	Identifier applied by GIS Software.
(R) Segment Description Road Full Street Name	VARCHAR(125)	The concatenation of the following fields in the order listed: Prefix Direction, Prefix Type, Road Name, Suffix Type, Suffix Direction
Segment Description Alternate Name Flag	BOOLEAN	Indicates if the Description record is an alternate, 'common' name as opposed to an official name given by the owner of the segment.
(R) Segment Description Road Left Low Address	VARCHAR(10)	Describes the left low address of a road segment as it relates to the Road Segment Description, assigned by the Road Data Steward.

(R) Segment Description Road Left High Address	VARCHAR(10)	Describes the left high address of a road segment as it relates to the Road Segment Description, assigned by the Road Data Steward.
(R) Segment Description Road Left Zip Code	VARCHAR(10)	Zip Code of address to the left of the line segment
(R) Segment Description Road Right Low Address	VARCHAR(10)	Describes the right low address of a road segment as it relates to the Road Segment Description, assigned by the Road Data Steward.
(R) Segment Description Road Right High Address	VARCHAR(10)	Describes the right high address of a road segment as it relates to the Road Segment Description, assigned by the Road Data Steward.
(R) Segment Description Road Right Zip Code	VARCHAR(10)	Zip Code of address to the right of the line segment
(R) Segment Description Road Name Prefix Direction	VARCHAR(10)	N, NW, S, SW, SE, E, NE
(R) Segment Description Road Name Prefix Type	VARCHAR(15)	Used to describe the road direction if it is incorporated into the beginning of the road name. N, NW, S, SW, SE, E, NE (e.g. SW Main Street).
(R) Segment Description Road Name	VARCHAR(50)	The name of the road
(R) Segment Description Road Name Suffix Type	VARCHAR(15)	The type of roadway, as per US Postal Addressing Standards. Avenue, Street, Lane, Highway, Road etc
(R) Segment Description Road Name Suffix Direction	VARCHAR(10)	Use to describe the road direction if it is incorporated into the end of the road name. N, NW, S, SW, SE, E, NE (e.g. Main St. SW)
(R) Segment Description Road Create Date	DATE	Date assigned to the Segment Description Road that indicates the date the segment description was created in WA-Trans.
Segment Description Road Update Date	DATE	Date assigned to the Segment Description Road that indicates the segment data update date in the WA-Trans database.
Segment Description Road Validate Date	DATE	Date assigned to Transportation Segment Road Description that indicates the segment data validation date.
Segment Description Road Retire Date	DATE	Date assigned to the Segment Description Road that indicates the segment data retirement date.
(R) Segment Description Identifier	CHAR(36)	Foreign key into the Segment Description table. Identifies the general segment descriptions associated with the road segment specific description.

Length Accuracy Measurement Method		Contains data pertaining to length accuracy and measurement method of a the segment
Length Accuracy Measurement Method Identifier	INTEGER	Surrogate Key. Sequential number auto-generated by the database upon insertion of a record. Used to uniquely identify a Length Accuracy Measurement Method record within the database.
(R) OBJECTID	INTEGER	Identifier applied by GIS Software.
(R) Length Accuracy Measurement Method Code	CHAR(3)	A 3-letter code assigned to the method of data capture
(R) Length Accuracy Measurement Method Code Description	VARCHAR(100)	Narrative description of the three character code, which describes the derivation of the Length Accuracy position and which allows the user to assess the accuracy and precision of the points x and y position. (FW-Length-Accuracy-Measurement-Method).

Status		Contains data pertaining to the current operations state: operational, retired, proposed or closed roads
Status Identifier	INTEGER	Surrogate Key. Sequential number auto-generated by the database upon insertion of a record. Used to uniquely identify a Status.
(R) OBJECTID	INTEGER	Identifier applied by GIS Software.
(R) Status Name	CHAR(25)	Name value indicating the nature of the transportation segment for use for the network. O-operational; R-retired; P-proposed; C-closed
(R) Status Description	VARCHAR (500)	Description of the Single character Status Name.

		O-operational; R-retired; P-proposed; C-closed

Stakeholder		Any organization that takes responsibility for proposing, designating or working in partnership with other organizations to build and maintain, or to make decisions about, the actual physical infrastructure, defining the FTRP and FTSeg, or the data being submitted to WA-Trans. The "stakeholder" may be the owner of the physical infrastructure (PI), the maintainer of the PI, or the owner, provider, maintainer or contributor of the data being submitted to WA-Trans (all of which can differ from the PI owner). The term "Stakeholder" therefore includes any organization that interacts with the WA-Trans System in any one of the following ways: Infrastructure Owner - An entity or organization that owns the physical infrastructure recorded within the WA-Trans System, and makes decisions about its planning, design, construction or maintenance. The owner could also delegate planning, design, construction or maintenance responsibilities to a third party. In addition, the owner could be the entity that legally owns, and has legal authority and responsibility over, the data that is being submitted to WA-Trans (i.e. the one who has legal authority to make decisions regarding the data that represents the physical infrastructure). In this case, the owner could also be the data steward. An example of an owner might be a larger entity such as a state government agency, county or municipal/city government. Infrastructure Maintainer - The entity that has the responsibility to maintain any part of the physical infrastructure for which data is recorded in the WA-Trans System. This entity may be different than the owner. An example in this case may be a State Route that passes through a city and an agreement between WSDOT and the city stipulates that the city is responsible for maintaining that portion of the State Route. In this case, WSDOT is the owner, but the city is the PI Maintainer. Data Maintainer - The entity that has the legal authority to make changes, edits, updates or alterations to the data that is provided to the WA-Trans system. This could be the same as the owner or steward, but it could also be a department, group, or individual(s) to which the owner or steward has delegated data editing/creation responsibilities. The data in question could be a portion of a data set that comprises of GPS collected line segments, points or a group of data, or an entire data set that the data steward is mandated to submit based on the signed DSA. This definition can be extended to an external third party working with, and on behalf of, the owner, steward, or user (e.g. a contractor or consultant). The data maintainer could also be the entity that is responsible for providing QA/QC to the data sets plus ensuring that the metadata are current, the specifics of which will be based on the negotiated data sharing agreements between WA-Trans and the entity that has ultimate authority over the data. In short, the data maintainer is the entity that works directly with the data and in all likelihood either is, or reports to, the data steward. The data maintainer will ultimately be the "contact" that will have the most detailed knowledge about the data, and information pertaining to the data maintainer will be tracked through the metadata submitted to WA-Trans. An example of a data maintainer might be a state, county or municipal/city government's department that handles geographic services. Data Steward - The entity that has legal authority to provide data, or ensure that data is provided, to the WA-Trans system. If the data steward is the same as the owner they may also have the legal authority to make all decisions pertaining to the data. The data in question could be a portion of a data set that comprises of GPS collected line segments, points or a group of data, or an entire data set that the data steward is mandated to submit based on the signed DSA. The data steward may also be the entity that is responsible for providing QA/QC to the data sets plus ensuring that the metadata are current, or delegating this responsibility to a third party (i.e. the data maintainer). The specifics of these duties will be based on the negotiated data sharing agreements between WA-Trans and the entity that has ultimate authority over the data. An example of a data steward might be a government department or person who is responsible for managing that entity's geographic data, which must be the best available source. User - An organization who does not participate in the defining of FTRP and FTSeg and does not contribute data to WA-Trans but who may wish to use the WA-Trans data.
Stakeholder Identifier	INTEGER	Surrogate Key. Sequential number auto-generated by the database upon insertion of a record. Used to uniquely identify a Stakeholder record within the database.
(R) OBJECTID	INTEGER	Identifier applied by GIS Software.
(R) Stakeholder Short Name	VARCHAR(6)	The standard acronym used for the organization. Example: WSDOT is the short name for Washington State Department of Transportation.
(R) Stakeholder Name	VARCHAR(60)	The actual name of the stakeholder that has decision rights over particular data.
Stakeholder Description	VARCHAR(300)	Describes who the Stakeholder is, and what the Stakeholder does

(R) Stakeholder Create Date	DATE	The date the stakeholder record was entered into the database
(R) Stakeholder Active Flag	INTEGER	Indicates if the Stakeholder is one that has current access to participate in WA-Trans. An example where a stakeholder may become inactive is a City has un-incorporated and is no longer a legal entity. This field will track such entities in the database.

3.2.3 Event Data

Event		Narrative of events that occur along transportation segments. These events are based on a linear referencing system. Events can pertain to location regarding Federal functional class, lanes, speed limits, structures, surface types and other data placed by linear referencing system.
Event Identifier	CHAR(36)	Surrogate Key. A GUID generated by database processes upon insertion of a record. Used to uniquely identify an Event Description record within the database.
(R) OBJECTID	INTEGER	Identifier applied by GIS Software.
(R) Event Local LRS Identifier	VARCHAR(15)	Segment description local identifier.
(R) Event Full LRS Description	VARCHAR(25)	The unique identifier of the LRS that assures a distinction between segments that may have the same Local Identifier; e.g. Main St. This field is created by concatenating the following fields together in the following way: FIPS State Code (2 characters) • StakeholderId (4 characters ONLY) • ModeId (2 characters only) • Local Identifier (15 characters) *SPECIAL NOTE: This schema requires /assumes the following: 1. The Stakeholder specified WILL be the Owner of the physical infrastructure. 2. Leading zeros will be added to any id field that is not yet 4 characters long (e.g. 1 becomes 0001, etc.) 3. We will have no more than 3.1. 9999 Authorities or 3.2. 99 Modes If we ever need to have Id's higher than these, than the entire structure of this field will have to be modified.
(R*) Event Begin Milepoint	DECIMAL(6,3)	Where an event begins along a route/line segment for route / milepoint LRS.
(R*) Event End Milepoint	DECIMAL(6,3)	Where an event terminates along a route/line segment for route / milepoint LRS.
(R*) Event Begin Address	VARCHAR(10)	Begin address number that is coincident with the beginning position of the specific event; e.g. 809. For address based events.
(R*) Event Begin Full Street Name	VARCHAR(125)	Begin full street name that is coincident with the beginning position of the specific event; e.g. Capital Blvd. SW. For address based events.
(R*) Event Begin Zip Code	VARCHAR(10)	Begin zip code that is coincident with the beginning position of the specific event; e.g. 98501. For address based events.
(R*) Event End Address	VARCHAR(10)	End address number that is coincident with the ending position of the specific event; e.g. 1009. For address based events.
(R*) Event End Full Street Name	VARCHAR(125)	End full street name that is coincident with the ending position of the specific event; e.g. Capital Blvd. SW. For address based events.
(R*) Event End Zip Code	VARCHAR(10)	End zip code that is coincident with the ending position of the specific event; e.g. 98504. For address based events.
(R*) Event Begin FIPS Left City Identifier	VARCHAR(5)	Based on segment direction, this identified the City on the left side of the beginning of the event. For address based events.
(R*) Event End FIPS Left City Identifier	VARCHAR(5)	Based on segment direction, this describes the City of the left side of the end of the event. For address based events.
(R*) Event Begin FIPS Right City Identifier	VARCHAR(5)	Based on segment direction, this describes the City at the right side of the beginning of the event. For address based events.
(R*) Event End FIPS Right City Identifier	VARCHAR(5)	Based on segment direction, this describes the City at the right side of the end of the event. For address based events.
Event Begin Northing	DECIMAL(10,3)	The Y-axis of a Cartesian grid system
Event Begin Easting	DECIMAL(10,3)	The X-axis of a Cartesian grid system
Event End Northing	DECIMAL(10,3)	The Y-axis of a Cartesian grid system

Event End Easting	DECIMAL(10,3)	The X-axis of a Cartesian grid system
(R) Event Create Date	DATE	The creation date of the data pertaining to the specified event.
Event Update Date	DATE	The date the data pertaining to the specified event was last updated.
Event Validate Date	DATE	The date that the event was validated (verified) in the database
Event Retire Date	DATE	The date that the event was retired from the database
Event Structure Local Code	VARCHAR(25)	This is the data contributors local identifier of the particular structure from the begin point to the end point.
Event Speed Limit Maximum Legal Speed	INTEGER	The legally defined maximum velocity for the section of segment between the specified “begin milepoint” and “end milepoint”. Example: 55
Event Speed Limit Maximum Legal Speed Unit	VARCHAR(3)	Defines the unit of measurement used for the speed limit. MPH - Miles per hour; KPH - Kilometers per hour
Event Federal Functional Class Code	CHAR(2)	The code assigned to the Federal Functional Class
Event Federal Functional Class Road Number	INTEGER	A number assigned to a portion of a transportation mode (generally roads) by the Federal government
Event Non-motorized Width	VARCHAR(25)	The linear distance on the Non-motorized section of the transportation mode, as measured in a direction perpendicular to the direction of travel.
Event Non-motorized Traffic Level	VARCHAR(15)	A description of the level of non-motorized traffic using this segment
Event Non-motorized Dedicated Flag	BOOLEAN	Indicates whether the Non-motorized portion of the transportation mode restricts travel to ONLY Non-motorized traffic, or if it is a mixed mode transportation segment (i.e. any transportation mode may traverse section). 1 = Yes, Dedicated Non-motorized travel only; 0 = No, Mixed mode.
Event HOV Lane Occupant Requirement	INTEGER	The minimum number of occupants that are required to be in a vehicle for that vehicle to travel in the HOV lane during the designated HOV time period.
Event HOV Lane Time Restriction	VARCHAR(50)	The time periods for which the HOV lane is restricted to HOV use only.
Event HOV Lane Use Indicator	VARCHAR(25)	Designates if the HOV Lane is a dedicated HOV lane at all times, or if other types of travel are permitted.
Event HOV Lane Activation Date	DATE	The calendar date the HOV lane began operating as an HOV lane.
Event Lanes Code	CHAR(1)	A code depicting the type of lane represented by a line segment
Event Lanes Count	INTEGER	The number of lanes in the section of segment from the specified “begin milepoint” to “end milepoint”.
Structure Type Identifier	INTEGER	Identifies the type of structure that is the “event”. (e.g. tunnel, bridge, etc.).
Event Structure Local Name	VARCHAR(100)	The commonly used name of the structure under consideration.
Event Surface Width	DECIMAL (6,3)	Typically the width of the runway, or a paved area that is used by aircraft
Event Indian Reservation Road Indicator	VARCHAR(3)	Indicates whether this is a reservation road, Yes/No
Event Indian Reservation BIA Road Indicator	VARCHAR(3)	Indicates whether this is a BIA recognized reservation road, Yes/No
Event Indian Reservation Code	VARCHAR(3)	A BIA Code referring to the reservation and related to the Reservation Name

Event Indian Reservation Name	VARCHAR(25)	Name of reservation
Event Indian Reservation Agency Code	INTEGER	A BIA Code referring to the agency and related to the Agency Name
Event Indian Reservation Agency Name	VARCHAR(20)	Name of the Reservation Agency
Event Indian Reservation BIA Functional Classification	INTEGER	The functional Class related to the BIA road classification system.
Event Indian Reservation Federal Aid Funding Category	VARCHAR(50)	A Funding Category based on the Federal Functional Class of a particular road. The funding category indicates the percent of local matching funds required to meet the total necessary
(R) Surface Type Identifier	INTEGER	Foreign key into the Surface Type table. Identifies the type of surface for the event.
(R) Event Type Identifier	INTEGER	Foreign key into the Event Type table. Identifies the type of event. E.g. HOV Lane, Non-Motorized lane speed limit structure, surface, etc.
(R) Event Data Steward Identifier	INTEGER	Foreign key that identifies the stakeholder who is the data steward for the event.
(R) Event Infrastructure Owner Identifier	INTEGER	Foreign key that identifies the stakeholder who owns the infrastructure represented by the event.
(R) Mode Type Identifier	INTEGER	Foreign key into the Mode Type table identifying the transportation mode for the event.
(R) Event Infrastructure Maintainer	INTEGER	Foreign key that identifies the maintainer of the physical infrastructure of the structure, i.e. bridges, tunnels, etc.
Event Average Daily Traffic Volume	INTEGER	The amount of traffic counted or calculated for a particular point, expressed and a whole number.
Event Average Daily Traffic Source	VARCHAR(50)	The Source of the traffic count represented by the Event Average Daily Traffic Volume
Event Average Daily Traffic Year	CHAR(4)	The year the Event Average Daily Traffic Volume was counted or calculated.
Event Average Daily Traffic Truck Percent	BYTE	The percent of the Event Average Daily Traffic Volume represented by trucks, expressed as a whole number.
(R) Reference Data Set Id	INTEGER	Foreign key into the Reference Data Set table.

Event Type		Designates the nature of the event; e.g. Functional Class, Speed Limit, Lane Type, Non-Motorized, Indian reservation Road, Surface Type, Structure, etc
Event Type Identifier	INTEGER	Surrogate Key. Sequential number auto-generated by the database upon insertion of a record. Used to uniquely identify an Event Type record within the database.
(R) OBJECTID	INTEGER	Identifier applied by GIS Software.
(R) Event Type Name	VARCHAR(25)	The name given to the nature of the event along a transportation mode. i.e. a change in surface type, number of lanes, speed limit, lane type (HOV, pedestrian/bicycle), classification etc.
(R) Event Type Description	VARCHAR(255)	Narrative explanation of the type of event

Surface Type		Contains information about the different categories of materials that may form the portion of the transportation mode. Examples include: asphalt, concrete, cinder, crushed gravel, etc.
Surface Type Identifier	INTEGER	Surrogate Key. Sequential number auto-generated by the database upon insertion of a record. Used to uniquely identify a Surface Type record within the database.
(R) OBJECTID	INTEGER	Identifier applied by GIS Software.
(R) Surface Type Name	CHAR(1)	Name identifying the type of surface to the Surface Type description (e.g. A = Asphalt or HMA, C = Concrete or PCCP, G = Gravel, D= Dirt or other naturally occurring surface)

(R) Surface Type Description	VARCHAR(100)	Description of the Surface Type (e.g. gravel, concrete, asphalt etc)

Structure Type		Contains information about the different categories of physical objects that may be located along a transportation mode. Examples include: Bridge, tunnel, etc.
Structure Type Identifier	INTEGER	Surrogate Key. Sequential number auto-generated by the database upon insertion of a record. Used to uniquely identify a Structure record within the database.
(R) OBJECTID	INTEGER	Identifier applied by GIS Software.
(R) Structure Type Name	VARCHAR(100)	Describes a structure found along the segment (e.g. bridge, tunnel, pedestrian overpass etc)
(R) Structure Type Description	VARCHAR(100)	Description of the Structure Type

Mode Type	Mode type describes the nature of the segment in question. Examples include: Road, Heavy Rail, Light Rail, Ferry, Non-Motorized, Aviation and Water Port.	
Mode Type Identifier	INTEGER	Surrogate Key. Sequential number auto-generated by the database upon insertion of a record. Used to uniquely identify a Mode Type record within the database.
(R) OBJECTID	INTEGER	Identifier applied by GIS Software.
(R) Mode Type Name	VARCHAR (25)	Name commonly used to refer to a method of transportation. (e.g. Road, Heavy Rail, Light Rail, Ferry, Non-Motorized, Aviation and Water Port etc.).
(R) Mode Type Description	VARCHAR (500)	Description of the Mode Type (as noted above)

3.3.4 Railroad

Reference Point Rail		Descriptive data pertaining to discrete locations along rail lines (examples include rail stations and rail crossing information)
Reference Point Rail Identifier	CHAR(36)	Surrogate Key. A GUID generated by database processes upon insertion of a record. Used to uniquely identify a Reference Point Rail record within the database.
(R) OBJECTID	INTEGER	Identifier applied by GIS Software.
Reference Point Rail Station Name	VARCHAR(75)	The name of the rail station
Reference Point Rail Crossing Code	VARCHAR(20)	Type of crossing - over, under, at grade
Reference Point Rail Public Private Crossing Indicator	VARCHAR(7)	Type of access/ownership of crossing – Public, Private, Pedestrian
Reference Point Rail Non-Motorized Crossing Flag	BOOLEAN: Default ON Boolean	Indicate whether this is a non-Motorized rail crossing (Yes/No)
Reference Point Rail Warning Device	INTEGER	Code identifying whether there is sign, or lights or other types of devices. From the Federal Railway Administration Data
Reference Point Rail USDOT Number	VARCHAR(7)	The USDOT code for the railroad line.
Reference Point Rail Track Count	INTEGER	The number of tracks within the rail segment.
(R) Reference Point Rail Create Date	DATE	Date assigned to Reference Point that indicates the date that Reference Point data was created in the WA-Trans database.
Reference Point Rail Update Date	DATE	Date assigned to Reference Point that indicates the date that Reference Point data was updated in the WA-Trans database.

Reference Point Rail Validate Date	DATE	Date assigned to Reference Point that indicates the date that Reference Point data was validated (verified).
Reference Point Rail Retire Date	DATE	Date assigned to Reference Point that indicates the date that Reference Point data was retired in the WA-Trans database.
Reference Point Identifier	CHAR(36)	Foreign key into the Reference Point table identifying the unique Reference Point associated with the rail terminal.

Segment Description Rail		Descriptive data pertaining to rail segments (examples include the name of the rail like, operator name, track class, etc)
Segment Description Rail Identifier	CHAR(36)	Surrogate Key. A GUID generated by database processes upon insertion of a record. Used to uniquely identify a Segment Description Rail record within the database.
(R) OBJECTID	INTEGER	Identifier applied by GIS Software.
Segment Description Rail Owner Name	VARCHAR(75)	The owners name of the "line" or railroad company
Segment Description Rail Owner FRA Code	VARCHAR(3)	The Federal Railroad Administration code used to identify the rail owner.
Segment Description Rail Primary Operator Name	VARCHAR(75)	Name of the primary operator of the line.
Segment Description Rail Primary Operator FRA Code	VARCHAR(3)	The Federal Railroad Administration code used to identify the primary rail operator.
Segment Description Rail WUTC Line Identifier	VARCHAR(10)	A code for railroad segments based upon the WA Utilities and Transportation Commission.
Segment Description Rail From Station	VARCHAR(20)	Name of origination station, generally a city or town name. Goes with WUTC Line Identifier.
Segment Description Rail To Station	VARCHAR(20)	Name of destination station, generally a city or town name. Goes with WUTC Line Identifier.
Segment Description Rail Passenger Flag	BOOLEAN	Identifies if a regularly scheduled passenger train uses the line.
Segment Description Rail Recreation Flag	BOOLEAN	Indicates whether the rail line is used for recreation. (Yes/No)
Segment Description Rail Type	VARCHAR(10)	Describes the nature of rail segment. This could be part of the mode code. Possible values include: siding, mainline, industrial spur
(R) Segment Description Rail Create Date	DATE	Date assigned to the Segment Description Rail that indicates the date the segment description was created in WA-Trans.
Segment Description Rail Update Date	DATE	Date assigned to the Segment Description Rail that indicates the segment data update date in the WA-Trans database.
Segment Description Rail Validate Date	DATE	Date assigned to Transportation Segment Rail Description that indicates the segment data validation date.
Segment Description Rail Retire Date	DATE	Date assigned to the Segment Description Rail that indicates the segment data retirement date.
(R) Segment Description Identifier	CHAR(36)	Foreign key into the Segment Description table. Identifies the segment description that is / are given for this rail segment.
(R) TrackClassID	INTEGER	Foreign key to the Track Class table. Identifies the Track Class description.

Track Class		Contains data related to the class of a rail line
TrackClassID	INTEGER	Surrogate Key. Sequential number auto-generated by the database upon insertion of a record. Used to uniquely identify a Track Class record within the database.
(R) OBJECTID	INTEGER	Identifier applied by GIS Software.
(R) Track Class Code	CHAR(1)	A 1-letter code assigned to Track Class

(R) Track Class Description	VARCHAR(200)	Narrative description of the one character code, which describes the Track Class.
Maximum Allowable Freight Speed	VARCHAR(3)	The maximum speed for a freight train allowed on this Track Class.
Maximum Allowable Passenger Speed	VARCHAR(3)	The maximum speed for a passenger train allowed on this Track Class.

3.3.5 Aviation

Segment Description Airport		Descriptive data pertaining to airport segments (e.g. runways)
Segment Description Airport Identifier	CHAR(36)	Surrogate Key. A GUID generated by database processes upon insertion of a record. Used to uniquely identify a Segment Description Airport record within the database.

Reference Point Airport		Contains data pertaining to Airport features of the transportation mode at the specified end point. Airport(s) -- an area of land or water that is used or intended to be used for the landing and takeoff of aircraft and includes its buildings and facilities, if any. For the purpose of these instructions, the term "airport(s)" includes airports, heliports, seaplane bases, stolports (short takeoff and landing airports), gliderports, ultralight flightparks, and balloonports except where a distinction is made in the text. - From: http://www.faa.gov/ARP/publications/acs/5200-35.pdf
Reference Point Airport Identifier	CHAR(36)	Surrogate Key. A GUID generated by database processes upon insertion of a record. Used to uniquely identify a Reference Point Airport record within the database.
(R) OBJECTID	INTEGER	Identifier applied by GIS Software.
(R) Airport Identifier	VARCHAR(4)	4-character code that identifies airports
(R) Instrument Approach	BOOLEAN	Airport is either equipped, or not equipped, to handle an instrument approach
(R) ARC Code	VARCHAR(4)	Size, weight, speed and length of wings from tip to tip; (can be used to determine maximum size of aviation vehicle that can utilize airport.)
(R) Elevation	DECIMAL(6,1)	The vertical distance above or below a reference ellipsoid. For WSDOT this reference ellipsoid is designated WGS84.
(R) Elevation Unit	VARCHAR(10)	The system of measurement used for the Elevation of the airfield; e.g. feet or meters.
FAA Classification	VARCHAR(30)	Federal Aviation Administration Classification. One of the five basic airport service levels which describe the type of service that the airport is expected to provide to the community at the end of the 5-year planning period. The service levels also represent funding categories for the distribution of Federal aid. PR Commercial Service - Primary CM Commercial Service – Non-primary CR Commercial Service Airport that also serves as a reliever (included with CM in statistical summaries) - RL Reliever Airport; GA General Aviation Airport
State Classification	VARCHAR(10)	Type of airport (e.g. cargo, transport, general etc)
(R) Airport Name	VARCHAR(100)	The actual name of the airport (e.g. Sea-Tac)
(R) Control Flag	BOOLEAN	Indicates if an Airport is controlled (i.e. has a tower) or not. 1 = Controlled (yes); 0 = Uncontrolled (no)
(R) AWAS Flag	BOOLEAN	Automated Weather Advisory System. Bit flag indicating if the airport on record has this system or not. 1 = Yes; 0 = No
(R) Owner	VARCHAR(30)	The actual owner of the airport (i.e. private owner, state, county etc)
Terminal Flag	BOOLEAN	Bit flag, which indicates whether or not the airport on record has a terminal or not. 1 = Yes; 0 = No
Airport Use	VARCHAR(15)	PU = Public use. A public use airport is an airport available for use by the general public without a requirement for prior approval of the owner or operator. The owners of public use airports cannot impose operational restrictions on the use of the airport. Restrictions such as prior permission required or use at your own risk or contact the airport manager prior to landing are not permissible at public use airports. PR = Private use. A private use airport is one available for use by the owner only or by the owner and other persons authorized by the owner only. The owners of private use airports do not have to reiterate in a

		remark in data element 110 that the airport is private use or that prior permission is required.
(R) Reference Point Airport Create Date	DATE	Date assigned to Reference Point that indicates the date that Reference Point data was created in the WA-Trans database.
Reference Point Airport Update Date	DATE	Date assigned to Reference Point that indicates the date that Reference Point data was updated in the WA-Trans database.
Reference Point Airport Validate Date	DATE	Date assigned to Reference Point that indicates the date that Reference Point data was validated (verified).
Reference Point Airport Retire Date	DATE	Date assigned to Reference Point that indicates the date that Reference Point data was retired in the WA-Trans database.
(R) Reference Point Identifier	CHAR(36)	Foreign key into the Reference Point table that identifies the Reference Point for the airport terminal.

3.3.6 Ferries

Reference Point Ferry		Descriptive data pertaining to ferry terminals
Reference Point Ferry Identifier	CHAR(36)	Surrogate Key. A GUID generated by database processes upon insertion of a record. Used to uniquely identify a Reference Point Ferry record within the database.
(R) OBJECTID	INTEGER	Identifier applied by GIS Software.
Reference Point Ferry Name	VARCHAR(50)	The name of the ferry terminal
(R) Reference Point Ferry Create Date	DATE	Date assigned to Reference Point that indicates the date that Reference Point data was created in the WA-Trans database.
Reference Point Ferry Update Date	DATE	Date assigned to Reference Point that indicates the date that Reference Point data was updated in the WA-Trans database.
Reference Point Ferry Validate Date	DATE	Date assigned to Reference Point that indicates the date that Reference Point data was validated (verified).
Reference Point Ferry Retire Date	DATE	Date assigned to Reference Point that indicates the date that Reference Point data was retired in the WA-Trans database.
(R) Reference Point Identifier	CHAR(36)	Foreign key into the Reference Point table identifying the ferry terminal.

Segment Description Ferry		Contains data pertaining to the Ferry transportation mode.
Segment Description Ferry Identifier	CHAR(36)	Surrogate Key. A GUID generated by database processes upon insertion of a record. Used to uniquely identify a Segment Description Ferry record within the database.
(R) OBJECTID	INTEGER	Identifier applied by GIS Software.
Segment Description Ferry Hours Not Available	VARCHAR(30)	Hours of ferry service not available.
Segment Description Ferry System-Wide Restriction	VARCHAR(30)	Descriptions of restrictions per ferry (e.g. Smoking, parking, hazardous goods etc.)
Segment Description Ferry Route Load Restriction	VARCHAR(30)	Ferry vehicle weight and height and width restrictions
Segment Description Ferry Route Length Restriction	VARCHAR(30)	Ferry vehicle length restrictions
Segment Description Ferry Route Crossing Time	DECIMAL(3,0)	The time it takes the ferry to travel the designated ferry route
(R) Segment Description Ferry Create Date	DATE	Date assigned to the Segment Description Ferry that indicates the date the segment description was created in WA-Trans.
Segment Description Ferry Update Date	DATE	Date assigned to the Segment Description Ferry that indicates the segment data update date in the WA-Trans database.

Segment Description Ferry Validate Date	DATE	Date assigned to Transportation Segment Ferry Description that indicates the segment data validation date.
Segment Description Ferry Retire Date	DATE	Date assigned to the Segment Description Ferry that indicates the segment data retirement date.
(R) Segment Description Identifier	CHAR(36)	Foreign key into the Segment Description table.

3.3.7 Metadata

Reference Data Set		Contains data pertaining to the metadata, translation files used during upload, download and maintenance of segments, Reference Points and Event data.
Reference Data Set Id	INTEGER	Surrogate Key. Sequential number auto-generated by the database upon insertion of a record. Used to uniquely identify a Data Set, or translation record within the database.
(R) OBJECTID	INTEGER	Identifier applied by GIS Software.
(R) Data Set File Name	VARCHAR(255)	Name of the Data Set determined by data provider.
(R) Data Set Enter Date	DATE	Date dataset, metadata or translation file was entered in the database.
(R) Meta Data File Name	VARCHAR(255)	Name of the Metadata file determined by data provider.
(R) Translation File Name	VARCHAR(255)	Name of the Translation file determined by data provider.
(R) Stakeholder Identifier	Integer	Foreign key into the Stakeholder table
Projection Name	VARCHAR(75)	Name of the projection for the set of data represented by the Metadata file.
Projection File Path	NVARCHAR(300)	Location of the Projection
Reference Data Set Title	NVARCHAR(300)	Tile of the Reference Data Set found in the Metadata file.
Content Begin Date	DATE	Begin date for the contents of this record.
Content End Date	DATE	End date for the contents of this record.

Appendix F – Proposed Metadata Standards Document

5.0 Metadata Standards

Introduction

There are many approaches for documenting geographic data for archival purposes and day-to day use. Some methods range from informal "read me" files discussing spatial reference information, lineage, and process steps to full FGDC compliant metadata with every field being required and populated. Washington State Geographic Information Council (WAGIC) established metadata standards for "significant geo-datasets" as defined in the Geographic Information Technology Standards for Metadata. This requires the collection and posting of metadata in a specific approved format for an existing or proposed "significant geo-dataset" before December 30, 2004.

5.1 Approved language

It is the policy of WA-TRANS that the completed framework dataset will include metadata that meets the requirements of the Working Subset Metadata Standard of FGDC/CSDGM. There will be fields, such as depth system definition, depth datum name, and raster object information that will not apply to the WA-TRANS, and they will be coded as "N/A" in the completed metadata document. The original metadata schema itself will not be modified to remove these fields.

5.2 Intent

- Geographic data must be properly documented for it to be stored and retrieved without a loss of information.
- WA-TRANS is a very significant geo-dataset that requires proper and as complete documentation as possible

5.3 Background Materials

Geographic Information Technology Standards for Metadata

"To facilitate implementation of this standard the WAGIC Basic and Working subsets of the FGDC Content Standard for Digital Geospatial Metadata are recognized as an approved implementation pathway."

WAGIC Basic Metadata Standard

This is the minimum required documentation to meet the Geographic Information Technology Standard for metadata before December 30, 2004.

Working Subset Metadata Standard of FGDC / CSDGM.

The Working Subset includes a Basic Subset plus following shaded elements. This is the minimum required documentation to meet the Geographic Information Technology Standard for metadata after 30 Dec, 2004.

5.4 Definitions:

- **Metadata** - "data about data" or "information describing content."
- **WAGIC** - Washington State Geographic Information Council
- **FGDC -** Federal Geographic Data Committee

5.5 WAGIC Basic Metadata Standard

Element Title | Element Purpose | Minimum Requirements

ISB / WAGIC - Basic Metadata Subset

From FGDC Content Standard for Digital Geospatial Metadata

Basic Subset - shaded areas identify actual data entry elements

	Element Name	Element Definition	FGDC Hierarchy	sgml tag name
	Identification Information	Basic information about the data set.	1	idinfo
1	Title	The name by which the data set is known	8.4	title
2	Publisher	Name of individual or organization that published the data set	8.8.2	publish
	Description	A characterization of the data set, including its intended use and limitations.	1.2	descript
3	Abstract	A brief narrative summary of the data set. Domain: free text.	1.2.1	abstract
4	Purpose	A summary of the intentions with which the data set was developed. Domain: free text	1.2.2	purpose
	Time Period of Content	Time period(s) for which the data set corresponds to the ground.	1.3	timeperd
	Range of Dates / Times	Means of encoding a range of dates and times.	9.3	rngdates
5	Beginning Date	The first year (and optionally month, or month and day) of the event. Domain: "Unknown" free date	9.3.1	begdate
6	Ending Date	The last year (and optionally month, or month and day) for the event. Domain: "Unknown" "Present" free date	9.3.3	enddate
7	Currentness Reference	The basis on which the time period of content is determined. Domain: "Ground Condition" "Publication Date" free text	1.3.1	current
	Keywords	Words or phrases summarizing an aspect of the data set.	1.6	keywords
	Theme	Subjects covered by the data set	1.6.1	theme
8	Theme Keyword	Common-use word or phrase used to describe the subject of the data set. Domain: free text	1.6.1.2	themekey
	Place	Geographic locations characterized by the data set.	1.6.2	place
9	Place Keyword	The geographic name of a location covered by a data set. Domain: free text	1.6.2.2	placekey
	Data Quality Information	A general assessment of the quality of the data set.	2	dataqual
	Lineage	Information about the events, parameters, and source data, which constructed the data set, and information about the responsible parties.	2.5	lineage
10	Source Information	List of sources and short discussion of the information contributed by each.	2.5.1	srcinfo
11	Source Time Period of Content	Time period(s) for which the source data set corresponds to the ground. Information about the date and time of an event.	2.5.1.4	srctime
	Range of Dates / Times	Means of encoding a range of dates and times.	9.3	rngdates
12	Beginning Date	The first year (an optionally month, or month and day) of the event. Domain: "Unknown" free date	9.3.1	begdate
13	Ending Date	The last year (and optionally month, or month and day) for the event. Domain: "Unknown" "Present" free date	9.3.3	enddate
	Entity and Attribute Information	Information about the content of the data set, including the entities types, their attributes, and the domains from which attribute values may be assigned.	5	eainfo
14	Overview Description	Summary of, and citation to detailed description of, the information content of the data set.	5.2	overview
15	Entity/Attribute Overview	Detailed Summary of the information contained in a data set. Domain: free text	5.2.1	eaover
	Point of Contact / Contact Information	Contact information for an individual or organization that is knowledgeable about the data set. Identity of, and means to communicate with, person(s) and organization(s) associated with the dataset.	10	ptcontac
16	Contact Person	The name of the individual to which the contact type applies. Domain: free text	10.1.1	cntper
17	Contact Organization	The name of the organization to which the contact type applies. Domain: free text	10.1.2	cntorg
18	Contact Position	The title of the individual. Domain: free text	10.3	cntpos
19	Contact Address	The address for the organization or individual.	10.4	cntaddr
20	Address Type	The information provided by the address. Domain: "Mailing Address" "Physical Address" "Mailing and Physical Address"	10.4.1	addrtype
21	Address	An address line for the address. Domain: free text	10.4.2	address
22	City	The city of the address. Domain: free text	10.4.3	city
23	State or Province	The state or province of the address. Domain: free text	10.4.4	state
24	Postal Code	The ZIP or other postal code of the address. Domain: free text	10.4.5	postal

25	Contact Voice Telephone	The telephone number by which individuals can speak to the organization or the individual. Domain: free text	10.5	cntvoice
26	Contact FAX Telephone	The telephone number of a FAX machine of the organization or individual. Domain: free text	10.7	cntfax
27	Contact E-Mail Address	The address of the electronic mailbox of the organization or individual. Domain: free text	10.8	cntemail

5.6 Working Subset Metadata Standard

Information Service Board Metadata Standard – Appendix A

Approved Working Level Subset of FGDC/CSDGM

(February 6th 2003)

Element Title | Element Purpose | Minimum Requirements

Working Subset includes Basic Subset plus following shaded elements

	Element Name	Element Definition	FGDC Hierarchy
	Status	The state and maintenance of information for the data set.	1.4
	Progress	The state of the data set. Domain: "Complete" "In Work" "Planned"	1.4.1
	Maintenance and Update Frequency	The frequency with which changes and additions are made to the data set after the initial data set is completed. Domain: "Continually" "Daily" "Weekly" "Monthly" "Annually" "Unknown" "As Needed" "Irregular" "None Planned" free text	1.4.2
	Spatial Domain	The geographic areal domain of the data set.	1.5
	Bounding Coordinates	The limits of coverage of a data set expressed by latitude and longitude values in the order western-most, eastern-most, northern-most, and southern-most. For data sets that include a complete band of latitude around the earth, the West Bounding Coordinate	1.5.1
	West Bounding Coordinate	Western-most coordinate of the limit of coverage expressed in longitude. Domain: -180.0 <= West Bounding Coordinate < 180.0	1.5.1.1
	East Bounding Coordinate	Eastern-most coordinate of the limit of coverage expressed in longitude. Domain: -180.0 <= East Bounding Coordinate < 180.0	1.5.1.2
	North Bounding Coordinate	Northern-most coordinate of the limit of coverage expressed in latitude. Domain: -90.0 <= North Bounding Coordinate <= 90.0; North Bounding Coordinate >= South Bounding Coordinate	1.5.1.3
	South Bounding Coordinate	Southern-most coordinate of the limit of coverage expressed in latitude. Domain: -90.0 <= South Bounding Coordinate <= 90.0: South Bounding Coordinate <= North Bounding Coordinate	1.5.1.4
	Theme Keyword Thesaurus	Reference to a formally registered thesaurus or a similar authoritative source of theme keywords. Domain: "None" free text	1.6.1.1
	Place Keyword Thesaurus	Reference to a formally registered thesaurus or a similar authoritative source of place keywords. Domain: "None" "Geographic Names Information System" free text	1.6.2.1
	Access Constraints	Restrictions and legal prerequisites for accessing the data set. These include any access constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the data. Domain: "None	1.7
	Use Constraints	Restrictions and legal prerequisites for using the data set after access are granted. These include any access constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the d	1.8
	Attribute Accuracy	An assessment of the accuracy of the identification of entities and assignment of attribute values in a data set.	2.1
	Attribute Accuracy Report	An explanation of the accuracy of the identification of the entities and assignments of values in the data set and a description of the texts used. Domain: free text	2.1.1
	Positional Accuracy	An assessment of the accuracy of the positions of spatial objects.	2.4
	Horizontal Positional Accuracy	An estimate of accuracy of the horizontal positions of the spatial objects.	2.4.1
	Horizontal Positional Accuracy Report	An explanation of the accuracy of the horizontal coordinate measurements and a description of the tests used. Domain: free text	2.4.1.1
	Vertical Positional Accuracy	An estimate of accuracy of the vertical positions in the data set.	2.4.2
	Vertical Positional Accuracy Report	An explanation of the accuracy of the vertical coordinate measurements and a description of the tests used. Domain: free text	2.4.2.1
	Source Scale Denominator	The denominator of the representative fraction on a map (for example, on a 1:24,000-scale map, the Source Scale Denominator is 24,000. Domain: Source Scale Denominator > 1	2.5.1.2
	Source Contribution	Brief explanation identifying the information contributed by the source to the data set. Domain: free text	2.5.1.6
	Spatial Data Organization Information	The mechanism used to represent spatial information in the data set.	3
	Direct Spatial Reference Method	The system of objects used to represent space in the data set. Domain: "Point" "Vector" "Raster"	3.2
	Raster Object Information	The types and numbers of raster spatial objects in the data set.	3.4 – **Not Applicable**
	Raster Object Type	Raster spatial objects used to locate zero-, one-, and two-, and three-dimensional locations in the data set. Domain: "Point" "Pixel" "Grid Cell" "Vexel"	**Not Applicable** - 3.4.1

	Spatial Reference Information	The description of the reference frame for, and the means to encode, coordinates in the data set.	4
	Horizontal Coordinate System Definition	The reference frame or system from which linear or angular quantities are measured and assigned to the position that a point occupies.	4.1
	Planar	The quantities of distances or, or distances and angles, which define the position of a point on a reference plane to which the surface of the Earth has been projected.	4.1.2

Working Subset includes Basic Subset plus following shaded elements – continued

	Element Name	Element Definition	FGDC Hierarchy
	Grid Coordinate System	A plane-rectangular coordinate system usually based on, and mathematically adjusted to, a map projection so that geographic positions can be readily transformed to and from plane coordinates.	4.1.2.2
	Grid Coordinate System Name	Name of the grid coordinate system. Domain: A code table	4.1.2.2.1
	State Plane Coordinate System (SPSC)	A plane-rectangular coordinate system established for each state in the United States by the National Geodetic Survey.	4.1.2.2.4
	SPCS Zone Identifier	Identifier for the SPCS zone. Domain: Four-digit numeric code for the State Plane Coordinate Systems based on the North American Datum of 1983 are found in Department of Commerce, 1986, Representation of geographic point locations for information interchange	4.1.2.2.4.1
	Planar Coordinate Information	Information about coordinate system	4.1.2.4
	Planar Distance Units	Units of measure used for distance	4.1.2.4.4
	Geodetic Model	Parameters for the shape of the Earth.	4.1.4
	Horizontal Datum Name	The identification given to the reference system used for defining the coordinates of points. Domain: "North American Datum of 1927" "North American Datum of 1983" free text	4.1.4.1
	Ellipsoid Name	Identification given to established representations of the Earth's shape.	4.1.4.2
	Semi-major Axis	Radius of the equatorial axis of the ellipsoid	4.1.4.3
	Denominator of Flattening Ratio	The denominator of the ratio of the difference between the equatorial and polar radii of the ellipsoid when numerator is set to 1.	4.1.4.4
	Vertical Coordinate System Definition	The reference frame or system from which vertical distances (altitudes or depths) are measured	4.2
	Altitude System Definition	The reference frame or system from which altitudes (elevations) are measured. The term "altitude" is used instead of the common term "elevation" to conform to the terminology in Federal Information Processing Standards 70-1 and 173	4.2.1
	Altitude Datum Name	The identification given to the surface taken as the surface of the reference frame from which altitude is measured	4.2.1.1
	Depth System Definition	The reference frame of system from which depths are measured	4.2.2 – **Not Applicable**
	Depth Datum Name	The identification given to surface of reference from which depths are measured	**Not Applicable** - 4.2.2.1
	Detailed Description	Description of the entities, attributes, attribute values, and related characteristics encoded in the data set.	5.1
	Entity Type	The definition and description of a set into which similar entity instances are classified.	5.1.1
	Entity Type Label	The name of the entity type. Domain: free text	5.1.1.1
	Entity Type Definition	The name of the entity type. Domain: free text	5.1.1.2
	Attribute	A define characteristic of an entity.	5.1.2
	Attribute Label	The name of the attribute. Domain: free text	5.1.2.1
	Attribute Definition	The description of the attribute. Domain: free text	5.1.2.2
	Attribute Domain Value	The valid values that can be assigned for an attribute.	5.1.2.4
	Enumerated Domain	The members of an established set of valid values.	5.1.2.4.1
	Enumerated Domain Value	The name or label of a member of the set. Domain: free text	5.1.2.4.1.1
	Enumerated Domain Value Definition	The description of the value. Domain: free text	5.1.2.4.1.2
	Range Domain	The minimum and maximum values of a continuum of valid values.	5.1.2.4.2
	Range Domain Minimum	The least value that the attribute can be assigned. Domain: free text	5.1.2.4.2.1
	Range Domain Maximum	The greatest value that the attribute can be assigned. Domain: free text	5.1.2.4.2.2
	Codeset Domain	Reference to a standard or list that contains the members of an established set of valid values.	5.1.2.4.3
	Codeset Name	The title of the codeset. Domain: free text	5.1.2.4.3.1
	Codeset Source	The authority for the codeset. Domain: free text	5.1.2.4.3.2
	Attribute Units of Measurement	The standard of measurement for an attribute value. Domain: free text	5.1.2.5
	Attribute Measurement Resolution	The smallest unit increment to which an attribute value is measured. Domain: Attribute Measurement Resolution > 0.0	5.1.2.6
	Citation Information	The recommended reference to be used for the data set.	8
	Originator	The name of organization or individual that developed data set.	8.1

	Publication Date	Date dataset published	8.2
	Title	The recommended name of dataset	8.4

5.7 Minimum Required Metadata

There are some minimum metadata elements necessary for WA-Trans to process submitted data. Metadata detailing the characteristics and quality of submitted transportation data must be included with any dataset provided to WA-Trans. The submitted Metadata should make every effort to meet the rigorous standards detailed above where feasible (See 5.5 and 5.6). Metadata must provide sufficient information to allow the user to determine if the geo-data set will meet the intended purpose, as well as telling the user how to access the data.

The functionality of the WA-Trans Data Provider Interface processes depends upon information contained in the metadata files and in the provider profile. An incomplete metadata file (a metadata file without the minimum required data elements) will reduce application functionality and the initial QA/QC necessary to ensure a useable data submission. To this end WA-Trans will accept Metadata that is not compliant with the standards detailed in section 5.4 and 5.6, but the absolute minimum, which WA-Trans will initially accept, is based on the functionality of the WA-Trans Data Provider Interface. To help with application functionality, in addition to the Metadata file a Data Provider Profile will be created.

To be a WA-Trans data provider the provider organization / jurisdiction must complete a Data Provider Profile, which will include many of the elements expected in an FGDC compliant metadata file. The profile will be used during the WA-Trans process of vetting providers who will be approved to contribute and provide information for the WA-Trans Data Provider Interface application to function correctly when data is provided (See Data Provider User Requirements)

The Data Provider Profile will include:

1. Name of the Organization or Jurisdiction,
2. Description of the Organization or Jurisdiction,
3. Organization Address,
4. Contact persons Full Name,
5. Contact persons address and all pertinent contact information (phone, FAX, Email etc),
6. What kind of data will be submitted,
7. What Theme (is this Road data, Rail data, list of all possible approved data themes),
8. Types of files which will be submitted (e.g. Shape, Coverage, CAD),
9. Accuracy of data,
10. Projection (e.g. either Washington State Plane North or Washington State Plane South),
11. Datum (e.g. NAD1983/HARN),
12. Frequency data will be provided

The Data Provider Profile will be in place prior to any data being provided by that provider to WA-Trans. This will allow WA-Trans to supplement data into missing elements of an incomplete metadata file. By being able to initially accept incomplete data and metadata into WA-Trans and begin the QA/QC processes, WA-Trans can more effectively work with the provider to help improve their submitted data and metadata quality.

The absolute minimum Metadata standards, for initial submission of data to WA-Trans, are shown in the tables on the following pages.

5.8 Minimum Required Metadata for WA-Trans Initial Data Submission (Table 1- 3)

Element Title | Element Purpose | Minimum Requirements

Basic WA-Trans Metadata Subset Table 1

Absolute Minimum Required Subset - shaded areas identify actual data entry elements

	Element Name	Element Definition	FGDC Hierarchy	sgml tag name
	Identification Information	Basic information about the data set.	1	idinfo
1	Title	The name by which the data set is known	8.4	title
2	Publisher	Name of individual or organization that published the data set	8.8.2	publish
	Description	A characterization of the data set, including its intended use and limitations.	1.2	descript
3	Abstract	A brief narrative summary of the data set. Domain: free text.	1.2.1	abstract
4	Purpose	A summary of the intentions with which the data set was developed. Domain: free text	1.2.2	purpose
	Time Period of Content	Time period(s) for which the data set corresponds to the ground.	1.3	timeperd
	Range of Dates / Times	Means of encoding a range of dates and times.	9.3	rngdates
5	Beginning Date	The first year (and optionally month, or month and day) of the event. Domain: "Unknown" free date	9.3.1	begdate
6	Ending Date	The last year (and optionally month, or month and day) for the event. Domain: "Unknown" "Present" free date	9.3.3	enddate
7	Currentness Reference	The basis on which the time period of content is determined. Domain: "Ground Condition" "Publication Date" free text	1.3.1	current
	Keywords	Words or phrases summarizing an aspect of the data set.	1.6	keywords
	Theme	Subjects covered by the data set	1.6.1	theme
8	Theme Keyword	Common-use word or phrase used to describe the subject of the data set. Domain: free text	1.6.1.2	themekey
	Place	Geographic locations characterized by the data set.	1.6.2	place
9	Place Keyword	The geographic name of a location covered by a data set. Domain: free text	1.6.2.2	placekey
	Data Quality Information	A general assessment of the quality of the data set.	2	dataqual
	Lineage	Information about the events, parameters, and source data, which constructed the data set, and information about the responsible parties.	2.5	lineage
10	Source Information	List of sources and short discussion of the information contributed by each.	2.5.1	srcinfo
11	Source Time Period of Content	Time period(s) for which the source data set corresponds to the ground. Information about the date and time of an event.	2.5.1.4	srctime
	Range of Dates / Times	Means of encoding a range of dates and times.	9.3	rngdates
12	Beginning Date	The first year (an optionally month, or month and day) of the event. Domain: "Unknown" free date	9.3.1	begdate
13	Ending Date	The last year (and optionally month, or month and day) for the event. Domain: "Unknown" "Present" free date	9.3.3	enddate
	Entity and Attribute Information	Information about the content of the data set, including the entities types, their attributes, and the domains from which attribute values may be assigned.	5	eainfo
14	Overview Description	Summary of, and citation to detailed description of, the information content of the data set.	5.2	overview
15	Entity/Attribute Overview	Detailed Summary of the information contained in a data set. Domain: free text	5.2.1	eaover
	Point of Contact / Contact Information	Contact information for an individual or organization that is knowledgeable about the data set. Identity of, and means to communicate with, person(s) and organization(s) associated with the dataset.	10	ptcontac
16	Contact Person	The name of the individual to which the contact type applies. Domain: free text	10.1.1	cntper
17	Contact Organization	The name of the organization to which the contact type applies. Domain: free text	10.1.2	cntorg
18	Contact Position	The title of the individual. Domain: free text	10.3	cntpos
19	Contact Address	The address for the organization or individual.	10.4	cntaddr

20	Address Type	The information provided by the address. Domain: "Mailing Address" "Physical Address" "Mailing and Physical Address"	10.4.1	addrtype
21	Address	An address line for the address. Domain: free text	10.4.2	address
22	City	The city of the address. Domain: free text	10.4.3	city
23	State or Province	The state or province of the address. Domain: free text	10.4.4	state
24	Postal Code	The ZIP or other postal code of the address. Domain: free text	10.4.5	postal
25	Contact Voice Telephone	The telephone number by which individuals can speak to the organization or the individual. Domain: free text	10.5	cntvoice
26	Contact FAX Telephone	The telephone number of a FAX machine of the organization or individual. Domain: free text	10.7	cntfax
27	Contact E-Mail Address	The address of the electronic mailbox of the organization or individual. Domain: free text	10.8	cntemail

Element Title | Element Purpose | Minimum Requirements

Working Subset includes Basic Subset plus following shaded elements Table 2			
	Element Name	**Element Definition**	**FGDC Hierarchy**
	Status	The state and maintenance of information for the data set.	1.4
	Progress	The state of the data set. Domain: "Complete" "In Work" "Planned"	1.4.1
	Maintenance and Update Frequency	The frequency with which changes and additions are made to the data set after the initial data set is completed. Domain: "Continually" "Daily" "Weekly" "Monthly" "Annually" "Unknown" "As Needed" "Irregular" "None Planned" free text	1.4.2
	Spatial Domain	The geographic areal domain of the data set.	1.5
	Bounding Coordinates	The limits of coverage of a data set expressed by latitude and longitude values in the order western-most, eastern-most, northern-most, and southern-most. For data sets that include a complete band of latitude around the earth, the West Bounding Coordinate	1.5.1
	West Bounding Coordinate	Western-most coordinate of the limit of coverage expressed in longitude. Domain: -180.0 <= West Bounding Coordinate < 180.0	1.5.1.1
	East Bounding Coordinate	Eastern-most coordinate of the limit of coverage expressed in longitude. Domain: -180.0 <= East Bounding Coordinate < 180.0	1.5.1.2
	North Bounding Coordinate	Northern-most coordinate of the limit of coverage expressed in latitude. Domain: -90.0 <= North Bounding Coordinate <= 90.0; North Bounding Coordinate >= South Bounding Coordinate	1.5.1.3
	South Bounding Coordinate	Southern-most coordinate of the limit of coverage expressed in latitude. Domain: -90.0 <= South Bounding Coordinate <= 90.0: South Bounding Coordinate <= North Bounding Coordinate	1.5.1.4
	Theme Keyword Thesaurus	Reference to a formally registered thesaurus or a similar authoritative source of theme keywords. Domain: "None" free text	1.6.1.1
	Place Keyword Thesaurus	Reference to a formally registered thesaurus or a similar authoritative source of place keywords. Domain: "None" "Geographic Names Information System" free text	1.6.2.1
	Access Constraints	Restrictions and legal prerequisites for accessing the data set. These include any access constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the data. Domain: "None	1.7
	Use Constraints	Restrictions and legal prerequisites for using the data set after access are granted. These include any access constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the d	1.8
	Attribute Accuracy	An assessment of the accuracy of the identification of entities and assignment of attribute values in a data set.	2.1
	Attribute Accuracy Report	An explanation of the accuracy of the identification of the entities and assignments of values in the data set and a description of the texts used. Domain: free text	2.1.1
	Positional Accuracy	An assessment of the accuracy of the positions of spatial objects.	2.4
	Horizontal Positional Accuracy	An estimate of accuracy of the horizontal positions of the spatial objects.	2.4.1
	Horizontal Positional Accuracy Report	An explanation of the accuracy of the horizontal coordinate measurements and a description of the tests used. Domain: free text	2.4.1.1
	Vertical Positional Accuracy	An estimate of accuracy of the vertical positions in the data set.	2.4.2
	Vertical Positional Accuracy Report	An explanation of the accuracy of the vertical coordinate measurements and a description of the tests used. Domain: free text	2.4.2.1
	Source Scale Denominator	The denominator of the representative fraction on a map (for example, on a 1:24,000-scale map, the Source Scale Denominator is 24,000. Domain: Source Scale Denominator > 1	2.5.1.2
	Source Contribution	Brief explanation identifying the information contributed by the source to the data set. Domain: free text	2.5.1.6
	Spatial Data Organization Information	The mechanism used to represent spatial information in the data set.	3
	Direct Spatial Reference Method	The system of objects used to represent space in the data set. Domain: "Point" "Vector" "Raster"	3.2
	Raster Object Information	The types and numbers of raster spatial objects in the data set.	3.4 – **Not Applicable**
	Raster Object Type	Raster spatial objects used to locate zero-, one-, and two-, and three-dimensional locations in the data set. Domain: "Point" "Pixel" "Grid Cell" "Vexel"	**Not Applicable** - 3.4.1
	Spatial Reference Information	The description of the reference frame for, and the means to encode, coordinates in the data set.	4
	Horizontal Coordinate System Definition	The reference frame or system from which linear or angular quantities are measured and assigned to the position that a point occupies.	4.1
	Planer	The quantities of distances or, or distances and angles, which define the position of a point on a reference plane to which the surface of the Earth has been projected.	4.12

Element Title | Element Purpose | Minimum Requirements

	Element Name	Element Definition	FGDC Hierarchy
		Working Subset includes Basic Subset plus following shaded elements – continued Table 3	
	Grid Coordinate System	A plane-rectangular coordinate system usually based on, and mathematically adjusted to, a map projection so that geographic positions can be readily transformed to and from plane coordinates.	4.1.2.2
	Grid Coordinate System Name	Name of the grid coordinate system. Domain: A code table	4.1.2.2.1
	State Plane Coordinate System (SPSC)	A plane-rectangular coordinate system established for each state in the United States by the National Geodetic Survey.	4.1.2.2.4
	SPCS Zone Identifier	Identifier for the SPCS zone. Domain: Four-digit numeric code for the State Plane Coordinate Systems based on the North American Datum of 1983 are found in Department of Commerce, 1986, Representation of geographic point locations for information interchange	4.1.2.2.4.1
	Planar Coordinate Information	Information about coordinate system	4.1.2.4
	Planar Distance Units	Units of measure used for distance	4.1.2.4.4
	Geodetic Model	Parameters for the shape of the Earth.	4.1.4
	Horizontal Datum Name	The identification given to the reference system used for defining the coordinates of points. Domain: "North American Datum of 1927" "North American Datum of 1983" free text	4.1.4.1
	Ellipsoid Name	Identification given to established representations of the Earth's shape.	4.1.4.2
	Semi-major Axis	Radius of the equatorial axis of the ellipsoid	4.1.4.3
	Denominator of Flattening Ratio	The denominator of the ratio of the difference between the equatorial and polar radii of the ellipsoid when numerator is set to 1.	4.1.4.4
	Vertical Coordinate System Definition	The reference frame or system from which vertical distances (altitudes or depths) are measured	4.2
	Altitude System Definition	The reference frame or system from which altitudes (elevations) are measured. The term "altitude" is used instead of the common term "elevation" to conform to the terminology in Federal Information Processing Standards 70-1 and 173	4.2.1
	Altitude Datum Name	The identification given to the surface taken as the surface of the reference frame from which altitude is measured	4.2.1.1
	Depth System Definition	The reference frame of system from which depths are measured	4.2.2 – **Not Applicable**
	Depth Datum Name	The identification given to surface of reference from which depths are measured	**Not Applicable** - 4.2.2.1
	Detailed Description	Description of the entities, attributes, attribute values, and related characteristics encoded in the data set.	5.1
	Entity Type	The definition and description of a set into which similar entity instances are classified.	5.1.1
	Entity Type Label	The name of the entity type. Domain: free text	5.1.1.1
	Entity Type Definition	The name of the entity type. Domain: free text	5.1.1.2
	Attribute	A define characteristic of an entity.	5.1.2
	Attribute Label	The name of the attribute. Domain: free text	5.1.2.1
	Attribute Definition	The description of the attribute. Domain: free text	5.1.2.2
	Attribute Domain Value	The valid values that can be assigned for an attribute.	5.1.2.4
	Enumerated Domain	The members of an established set of valid values.	5.1.2.4.1
	Enumerated Domain Value	The name or label of a member of the set. Domain: free text	5.1.2.4.1.1
	Enumerated Domain Value Definition	The description of the value. Domain: free text	5.1.2.4.1.2
	Range Domain	The minimum and maximum values of a continuum of valid values.	5.1.2.4.2
	Range Domain Minimum	The least value that the attribute can be assigned. Domain: free text	5.1.2.4.2.1
	Range Domain Maximum	The greatest value that the attribute can be assigned. Domain: free text	5.1.2.4.2.2
	Codeset Domain	Reference to a standard or list that contains the members of an established set of valid values.	5.1.2.4.3
	Codeset Name	The title of the codeset. Domain: free text	5.1.2.4.3.1
	Codeset Source	The authority for the codeset. Domain: free text	5.1.2.4.3.2
	Attribute Units of Measurement	The standard of measurement for an attribute value. Domain: free text	5.1.2.5
	Attribute Measurement Resolution	The smallest unit increment to which an attribute value is measured. Domain: Attribute Measurement Resolution > 0.0	5.1.2.6
	Citation Information	The recommended reference to be used for the data set.	8

	Originator	The name of organization or individual that developed data set.	8.1
	Publication Date	Date dataset published	8.2
	Title	The recommended name of dataset	8.4

Appendix G – Draft WA-Trans Data Standards Document

Washington State Department of Transportation

WA-Trans GIS Data Standards

Created for the Washington State
Transportation Framework (WA-Trans)

Version 8.0

Last Updated: January 2, 2007

WA-Trans Steering Committee Meeting Notes
January 4, 2007

WA-Trans Steering Committee Meeting Notes
January 4, 2007

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Introduction

The Washington Statewide Transportation Framework Project (WA-Trans) was organized to create an electronic map and spatial data set of transportation data for use in Geographic Information Systems (GIS) across the state. The WA-Trans partners have delegated the development of the Transportation Framework Data Standards to the WA-Trans steering committee. These standards are comprised of road, rail, transit, ferries, air, and non-mechanized transportations modes. The data standards will be used as a guideline for data collection during two pilot projects in the Puget Sound and along the Oregon-Washington border. These standards will be adjusted as necessary as experience is steadily being acquired during these pilot projects.

Mission and Goals of the Data Standards

The WA-Trans Data Standard will enhance the will and ability of partners to collect and maintain the data, and to allow data quality to improve over time for long-term data maintenance and updates. This process will also help participants recognize the capabilities of existing technology and upgrade their technology as it advances.

Intended Use Description

The purpose of the WA-Trans Data Standards is to create a set of common requirements for the collection and exchange of information from a variety of spatial and tabular data sources (GIS, CAD, etc.) This information will create a statewide set of data layers developed as a comprehensive transportation network.

1.0 Scope – Basic Overview of data types, mechanisms

The scope of the WA-Trans Data Standards identifies the modes of transportation data to be collected. It also includes the geographic extent, scale, datum, metadata, linear referencing, feature attributes, and data quality. Other relevant information can be found in the WA-Trans Data Model, WA-Trans Data Characteristics, WA-Trans Metadata Standards, Architecture and Processes documentation.

2.0 Definitions

Term	Definition
Agreement point	A concordance between two parties, who possess overlapping data sets, and who share data boundaries, over the location of shared map features.
ArcGIS Feature Class	A feature class is a collection of geospatial features within the Environmental Systems Research Institute (ESRI) geodatabase that are of the same type of geometry, include the same attributes, and share the same spatial reference.
Attribute	Descriptive information or an inherent characteristic about a feature or entity. Typically used in a database to describe features or entities as they exist in the real world, and linked to other attributes and information through related tables by a unique identifier.
BMP	**Bitmapped graphics format** (.bmp extension) used internally by the **Microsoft Windows** graphics **subsystem** for raster (pixel based) data
Concatenate	To join two or more character strings together, end to end, this creates one unique string.
Conflation	A set of procedures that combines data, usually, in the case of geographic data applying attribution from one data layer to the geometry of another.
Data Steward	The entity that has legal authority to provide data, or ensure that data is provided. If the data steward is the same as the owner they may also have the legal authority to make all decisions pertaining to the data. The data in question could be a portion of a data set that comprises of Global Positioning System (GPS) collected line segments, points or a group of data, or an entire data set that the data steward is mandated to submit based on a signed Memorandum of Understanding

	(MOU) or Data Sharing Agreement. The data steward may also be the entity that is responsible for providing quality assurance and quality control for the data sets plus ensuring that the metadata are current, or delegating this responsibility to a third party (i.e. the data maintainer).
DBF	DBF is a generic database file type (.dbf extension), Dbase, that allows for the transfer of data between various database programs.
DIE	ArcGIS Data Interoperability Extension eliminates barriers for data sharing by providing state-of-the-art direct data access, transformation, and export capabilities. This extension enables ESRI ArcGIS Desktop users to easily use and distribute data in many formats.
DGN	The Design File format (.dgn extension) common to Intergraph's MicroStation and Interactive Graphics System (IGDS) Computer Aided Drafting (CAD) applications running on Intergraph workstations and personal computers
DXF	Data Exchange File (.dxf extension), a two-dimensional **graphics file format** **supported** by virtually all **PC** -based **CAD** products. It was created by AutoDesk for the AutoCAD **system**.
Entity	A collection of objects (persons, places, things) described by the same attributes. Entities in the case of WA-Trans are identified during the conceptual design phase of database and application design.
ESRI shapefile	A **geospatial** **vector** data format for **geographic information systems** software, developed by **ESRI** as an **open specification** for data interoperability among **ESRI** and other software products. A "shapefile" commonly refers to a collection of files with ".shp", ".shx", ".**dbf**", and other extensions on a common prefix name (ex. "lakes.*").
Event	An event describes a location that can be used to identify a specific point, or a portion of a finite distance along a line along a linear route relative to a fixed starting point. Event positions are measured/calculated from a defined point and depict occurrences along a line as measured from that defined starting point. Event types include address events, route events, x y events, and temporal events, all of which can be viewed in a GIS as if it were a part of the spatial data.
Excel	A spreadsheet software created by Microsoft that is used to store information in columns and rows which can then be organized and/or processed. The extension is .xls.
Feature	A representation of a real-world object on a map. Features can be represented in a database (or a Geographic Information System (GIS)) as vector data (points, lines, or polygons) or as cells in a raster data format. Features can also be a group of spatial elements that together represent a real-world entity. A complex feature is made up of more than one group of spatial elements: for example, a set of line elements with the common theme of roads representing a road network.
GIF	Graphics Interchange Format (.gif extension), a **file format** for raster (pixel based) data.
JPEG	Joint Photographic Experts Group (.jpg extension) file format for raster (pixel based) data.
Linear Referencing System:	A way to geographically define a feature or location by its distance from a known point along a route such as a highway, rail line, pipeline, etc.
MDB	ESRI Personal Geodatabase format or Microsoft Access database file (.mdb extension). **Geodatabases** are **relational databases**, created and maintained by ESRI, that contain geographic information. Geodatabases contain ArcGIS feature classes and tables.
Metadata	Properties and documentation about the content, quality, condition, and other characteristics of data. Metadata for geographic data may document its subject matter; how, when, where, and by whom the data was collected; accuracy; availability, distribution information, projection, scale, resolution, accuracy, and its reliability with regard to some standard. Not to be confused with attribute data, which describes the feature in the real world (as noted above).
Model Builder	Model Builder is an interactive environment in ESRI's ArcGIS software that provides a graphical modeling framework for designing and implementing geoprocessing models (models that can perform spatial operations) that can include tools, scripts and data. Such a tool can be used to translate data from one format and schema to another.
National Map	The National Map is a consistent framework for geographic knowledge needed by the Nation. It provides public access to high-quality, geospatial data and information from multiple partners to help support decision making by resource managers and the public.
Pilot Advisory Team	This committee is formed for the duration of a WA-Trans pilot. It consists of the Project Manager, Pilot Technical Lead, WA-Trans Steering Committee Member(s) and Partner Representative(s).
Point	A point is a single object with a specific geographic location. Point data can be based on dynamic segmentation of roadways (using mileposts or distance from intersection), x, y coordinates from GPS, or geocoded addressing information. It is typically a zero-dimensional abstraction of an object that usually represents a geographic feature too small to be displayed as a line or area at that scale.
Polygon	A polygon is a closed, two-dimensional figure that represents an area. It is used in GIS to describe spatial elements with a discrete area, such as parcels, political districts, homogeneous land use, and soil types. Polygon data layers may be used as a reference for clipping other data layers.
Puget Sound Pilot	The WA-Trans Pilot I is the first step in implementation of the statewide transportation framework. It is geographically situated to test the implementation in an urban area made up of local governments with sophisticated GIS and data. Experience gained will be used in all future WA-Tran pilots and will be the basis for cost, and labor estimates and other project decisions. Documented business value will provide incentives for funding and participation in support of the overall project vision and objectives.

Segment (Line)	A part of a **line** that is bounded by two end **points**, and contains every point on the line between its end points.
Segment Mode	The mode of transportation associated with a particular line segment
TIFF	Tagged Image File Format (.tif extension), a **file format** for raster (pixel based) data.
Topology	The spatial relationships between connecting or adjacent features (e.g., arcs, nodes, polygons, points and pixels). The geometric relationships are determined mathematically between connecting or adjacent features in a geographic data set. Topology may include information about connectivity, direction, length, adjacency, and polygon definition. Topology is what makes most types of geographic analysis in a GIS possible because it allows the analysis of spatial relationships between features.
Translation	The act of importing data of one schema (a set of data and field definitions) into a different schema.
Translator	Computer software that facilitates the import and export of data into different schemas.
TXT	A generic format for the transfer of tabular data that can be edited via Notepad or WordPad. The extension is .txt.
Washington State Geospatial Framework	The framework is geospatial data that is collected and maintained by many organizations in Washington State that will be organized and managed cooperatively and will support the National Spatial Data Infrastructure (NSDI). The framework will include digital orthoimagery, elevation, transportation, hydrography, governmental units and cadastral data. Framework participants will work together in partnership to develop common data management protocols and to reduce duplication of effort.
Washington State Transportation Framework	Transportation Framework, called WA-Trans, is a statewide transportation database of location-based transportation data to use in GIS across the state. Data includes information about roads, rails, ferries, ports, aviation and non-motorized transportation infrastructure. The data will be seamless, connected, consistent and continuous between jurisdictions and boundaries and other framework layers and will be continuously improved.

2.2 Symbols and Abbreviations

The Blue Descriptions are links to related data on We sites.

Abbreviation	Description
BLM	Bureau of Land Management
BLM GTN	BLM Ground Transportation (Roads & Trails)
BMS	**Bridge Management Systems**
CRAB	County Road Administration Board (Washington)
CRIS	County Road Information System (Washington). The system that will eventually replace CRIS is called Mobility.
CAD	Computer Aided Design
CADD	Computer Aided Design & Drafting
COG	***Council of Governments***
CSDGM	Content Standard for Digital Geospatial Metadata (Working subset metadata standard)
CTM	Cooperative Topographic Mapping (USGS)
DSA	***Data Sharing Agreement***
FGDC	Federal Geographic Data Committee
FMG	**Framework Management Group *(WAGIC)***
FTRP	Framework Transportation Segment Reference Point- "Specified location of a (required) endpoint of a Framework Transportation Segment (FTSeg), or an (optional) reference point offset along the length of the FTSeg, on a physical transportation system". NSDI Framework Transportation Identification Standard, page 27.
FTSeg	**Framework Transportation Segment**
GBF	Geographic Base File
GDT	Geographic Data Technology (Commercially available integrated roadway data)
GIS	Geographic Information System
GPS	Global Positioning System
HOV	High Occupancy Vehicle (as in HOV Lanes)
IRICC	Interagency Resource Information Coordinating Council
ISB	Information Services Board (WSDoT Geographic Information Technology Subcommittee)
LLRS	Linear Location Reference System

LOS	Level of Service
LRS	Linear Reference System (PDF)
MPO	Metropolitan Planning Organization (e.g. COG, SRTC etc.)
MSAG	Master Street Address Guide (911 data)
NAD	North American Datum
NCHRP	National Cooperative Highway Research Program
NHS	National Highway System
NIMA	National Imagery and Mapping Agency (USGS)
NSDI	National Spatial Data Infrastructure
ODOT	Oregon State Department of Transportation
PMS	**Pavement Management Systems**
PSRC	Puget Sound Regional Council
REO	Regional Ecosystem Office
RRT	**Related Route Type**
SDTS	Spatial Data Transfer Standard
TIGER	Topologically Integrated Geographic Encoding and Referencing - US Census database with roads and ranges of street addresses
TRIPS	Transportation Information and Planning Support
USFS	United States Forest Service
USGS	United States Geological Survey
USGS DLG	United States Geological Survey Digital Line Graph (USGS format digital vector representation of cartographic information)
USPS	United States Postal Service
WAGDA	Washington Geospatial Data Archive ***(U of W)***
WAGIC	Washington State Geographic Information Council
(WA) DNR	(Washington State) Department of Natural Resources
WA-Trans/WA-TRANS	Washington Transportation Framework for GIS
WSDOT/WSDoT	Washington State Department of Transportation
WUTC	Washington Utilities and Transportation Commission

3.0 Data Characteristics

The data characteristics are outlined in the WA-Trans Standards Data Characteristics document. The Data Characteristics document details the attribution for all transportation modes and attribution for specific transportation modes. These requirements are subject to change based on findings during the two pilot projects. Included in the Data Characteristics is the complete attribution for WA-Trans with detailed descriptions of the attributes. Also included are the minimum required attributes necessary for a provider dataset being submitted to WA-Trans, with detailed attribute descriptions designed to assist with the transformation from a providers data schema to the WA-Trans data schema.

4.0 Spatial Data Rules

1) Within a given mode, segments will be broken at public, at-grade intersections and at jurisdictional boundaries (city, county, state).

    a. To facilitate accurate address geocoding, at-grade, non-road crossings with roadways will be identified with '2nd Order Points.' 2nd order points will also be used to identify public/private at-grade road intersections. 2nd Order Points identify special types of intersections that are important to document, but need not be used to break the roadway segment. Use of 2nd order points avoids over-segmentation of roadway segments, while

allowing the possibility for entities to define agreement points at such intersections. Such a point can stand-alone and provides a means to clip a roadway segment, if needed, for a geometric network, or for use by those who include public/private intersections in their road systems.

b. Modes that share the roadbed - for instance a bike lane along a roadway - will be treated as a roadway event for the shared extent.

2) Topology/navigable network will be provided in WA-Trans through the following rules:

   a. A reference point (segment point), is located at the begin and end of each segment, (called from and to points)

   b. The segment direction is stored in the description table,

   c. The relationship between segments and reference points (segment points), is manifested in the description table.

   d. Connectivity is supported through the association of a single point (in the WA-Trans Database) with more than one segment. The point can act as both a from and to point based upon the description for each particular segment.

3) Roadways and railroads will always have a separate geometry (a segment can never contain information about a contiguous rail and road element). Unique segment ID methodology as per FGDC standards will be utilized.

4) Segments will be broken at jurisdiction boundaries (city, county, state boundaries).

5) A split of an existing segment will result in retirement of the original Segment ID and assignment of two new Segment IDs.

6) Any segment or Reference Point geometry edits, joins, or splits force an update of all associated items referenced in the Events Description Table.

7) Reference Point IDs will not change. If the location of a Reference Point changes, the ID is retired via the id status field and a new ID is assigned (facilitating their use as multi-modal transfer stations).

8) Linear features must match at jurisdictional boundaries, which will be achieved through agreement points.

9) Time/Date stamping shall be used to ensure proper records management, and adequate metadata. This will be handled by the database – WA-Trans submission date.

10) FGDC compliant metadata shall be maintained for all datasets.

11) Multi-modal line segments will be accommodated with the use of multiple line segments with coincident geography (i.e. stacked arcs along a congruent segment). Modes that share the roadbed - for instance a bike lane along a roadway - will be treated as a roadway event for the shared extent.

12) Database fields that are submitted with blank names and unnamed roads will be handled by the translator through nulls, empty strings, and blank spaces.

13) Spatial Accuracy will be handled by domain and metadata.

14) State routes, county routes, and city routes – All to be defined within their respective records

15) State Route (SR), Related Route Type (RRT) and Related Route Qualifier (RRQ) will be used to identify Ramps and Spurs. Such roadway features will be identified with a three character State

Route Number (with leading zeroes) plus the two-character code for the Related Route Type and the 6 character Related Route Qualifier (see Appendix-A for a more detailed description)

16) For each type of event (speed, HOV, etc.) there will be an event specific field required.

4.1 Rules for submission – Refer to 6.1 Quality Assurance and Quality Control (Phase I)

- Best available datasets must be topologically clean when in GIS format
- Line features should be contiguous across data set extents (i.e. where a single geographic feature is split into adjacent coverage's or tiles, it should be edge-matched).
- Every feature (point, line, etc) should have one attribute record.
- Each layer of submitted data needs to have complete required attributes as designated by the required attributes described in section (3.1) above.
- Must only submit data of which you are the legal "data steward" as defined by the WA-Trans Standards documentation. This will be as determined by the Data Sharing Agreement signed between WA-Trans and the organization/entity that has legal authority and responsibility over the data that is being submitted to WA-Trans.
- All data will have metadata that will be included with data submission.
- Any authority providing Event data MUST also provide their Segment Description data for all appropriate Segments within the event.

5.0 Metadata Standards

There are many approaches for documenting geographic data for archival purposes and day-to day use. Some methods range from informal "read me" files discussing spatial reference information, lineage, and process steps to full FGDC metadata with every field being required and populated. WAGIC established metadata standards for "significant geo-datasets" as defined in the Geographic Information Technology Standards for Metadata. This requires the collection and posting of metadata in a specific approved format for an existing or proposed "significant geo-dataset" before December 30, 2004. **Please refer to the WA-Trans Metadata Standards document for technical details concerning the Metadata standards and the minimum requirements for WA-Trans.**

5.1 Approved language

It is the policy of WA-TRANS that the completed framework dataset will include metadata that meets the requirements of the Working Subset Metadata Standard of FGDC/CSDGM. There will be fields, such as depth system definition, depth datum name, and raster object information that will not apply to the WA-TRANS, and they will be coded as "N/A" in the completed metadata document. The original metadata schema itself will not be modified to remove these fields.

5.2 Intent

- Geographic data must be properly documented for it to be stored and retrieved without a loss of information.
- WA-TRANS is a very significant geo-dataset that requires proper and as complete documentation as possible.

5.3 Background Materials

Geographic Information Technology Standards for Metadata

"To facilitate implementation of this standard the WAGIC Basic and Working subsets of the FGDC Content Standard for Digital Geospatial Metadata are recognized as an approved implementation pathway."

WAGIC Basic Metadata Standard

This is the minimum required documentation to meet the Geographic Information Technology Standard for metadata before December 30, 2004.

Working Subset Metadata Standard of FGDC / CSDGM.

The Working Subset includes a Basic Subset plus following shaded elements. This is the minimum required documentation to meet the Geographic Information Technology Standard for metadata after30 Dec, 2004.

6.0 Data Quality

6.1 Quality Assurance and Quality Control (Phase II)

Quality assurance and quality control (QA/QC) are the processes and tools, which establish and enforce data consistency and data accuracy. In an environment where data is being integrated from multiple sources, it is a critical function. Software can be built to enforce QA/QC in the following categories:

- Topological – checks regarding connectivity of the line work at intersections, overpasses and bridges represented as separate features, segments meeting at jurisdictional boundaries, etc.
- Scale/Spatial – Does the location accuracy meet the planned business use of the data; does the "aesthetic" representation of the transportation feature meet the business requirements?
- Attribute – Are the minimum required fields included, are the field descriptions met, how many of the attributes are populated, are the attribute values valid?
- Metadata – Concerns regarding metadata include: has the required metadata been provided, is it complete, and does it conform to established metadata standards; does the metadata match the layer?

All of these are standard GIS requirements for checking data and when the environment is one of handling data from a variety of sources, it is critical that they be supported with software tools to facilitate efficient checking and validation.

6.2 Data Scale (Expressed targets)

This will be a multi-scale dataset			
Urban	1:1,200	1:6,000	1:24,000
Rural	1:6,000	1:24,000	1:48,000
Remote	1:24,000	1:48,000	1:100,000

6.3 Data Accuracy (Expressed targets)

	Urban	**Rural**	**Remote** (Agriculture / Forestry)

	High	Medium	Low	High	Medium	Low	High	Medium	Low
Spatial Accuracy	1 ft.	5 ft.	40 ft	5 ft	40 ft	50 ft	40 ft.	50 ft.	100 ft.
Update Frequency	1 month	6 months	1 year	1 year	2 years	3 years	1 year	2 years	5 years
Attribute Completeness	95%	80%	70%	95%	80%	70%	N/A	N/A	N/A
Source Scale	1:1,200	1:6,000	1:24 K	1:6,000	1:24 K	1:48 K	1:24 K	1:48 k	1:100 K

6.4 Coordinate System Standards

In support of the above objectives Washington State adopts the following technical standards related to Datum and Coordinate Systems for significant geo-datasets. This standard is intended to apply to existing and new 'significant' agency geo-datasets

Datum:

North American Datum 1983 (1991 adjustment) as defined by the National Geodetic Survey. (Also referred to as: NAD83/91)

Coordinate System:

The standard coordinate system shall be the Washington Coordinate System of 1983 alternately; the Geographic Coordinate System may be used.

Washington Coordinate System of 1983

- The system of plane coordinates established by the National Geodetic Survey for defining and stating the positions or locations of points on the surface of the earth within the state of Washington is referred to as the Washington Coordinate System of 1983.
- The coordinate system standard for significant geo-dataset is Washington Coordinate System of 1983 (WCS 83) zone appropriate for geo-datasets that are maintained within the WCS 83 North zone or, WCS 83 South zone.
- The standard is Washington Coordinate System of 1983 South zone if the geo-dataset is maintained as a statewide layer or, a regional layer crossing zones.
- Standard unit of measure is US Survey Foot. For agencies that must maintain unit of measure in meters, the standard conversion of coordinates between the meter and the US survey foot shall be based upon the length of the meter being equal to exactly 39.37 inches.

Geographic Coordinate System

- Alternately, geospatial data may be stored in geographic coordinates on the North American Datum of 1983/91, in decimal degrees with negative West longitudes and positive North latitudes.
- Geographic coordinates (latitude & longitude values) on a geo-centric datum comprise a reference system for measuring Earth locations. This system provides a continuous, consistent reference framework for locating features anywhere in the state and beyond. The system is readily compatible with global positioning system data and is the reference system intended for Washington State Geospatial Framework data.

7.0 Stewardship

7.1 Update Cycles

- Need decisions on best available data for each data layer and/or scale.
- Here data could be submitted to source agency when concatenating with tabular or spatial data. If this is acceptable this will reduce the need to concatenate data repeatedly with each update cycle.
- Also will need to define a regular update cycle for data. Many agencies have an annual update cycle based on budget cycle. Would this dictate framework update cycle? Yearly updates, quarterly?

8.0 Data Layers

8.1 Core Data Sets:

- Federal
- State Highway System
- Highway Ramps – WSDOT naming convention
- Rest Areas
- Weigh Stations
- Local Roads
- Railroads
- Ferry Transit Routes – include ferry terminal locations, includes staging areas as segments and connector roads
- Airports – includes airport locations, connector roads and runway segments

8.2 Event Datasets:

- Scenic Highways – attribute (Not yet modeled)
- Tribal Road Designators
- Non-Motorized Transportation Modes
- Port Facilities – attribute (Not yet modeled)
- Bridges – attribute (Not yet modeled)
- Park and Rides – attribute (Not yet modeled)

8.3 Reference (Boundary) Datasets:

- County Boundaries

- Reservation Boundaries
- Urbanized Areas

8.4 Supporting Datasets:

- CRIS Data – Core attribution
- Survey Data – Core attribution
- Bridges, culverts – attribute (event), eventually end points for bridges

8.5 Interfaces

- Mobility
- Geospatial One-stop

9.0 References

- All Roads (HARP), ODT, Watterson and Brady, 2003 v5 draft
- ANSIT, Geographic Information Framework-Data Content Standards for Transportation Networks: Roads
- Oregon Road Centerline Standard, ODT, V.2, 2003 draft
- Michigan Framework – web
  - http://www.michigan.gov/cgi/0,1607,7-158-12759_14194---,00.html
- Arizona Framework – web
- Dueker white paper
- King Co Standards
  - http://www.metrogis.org/data/standards/address_guidelines.shtml
- Minnesota Data Standards
  - http://www.co.clay.mn.us/Depts/GIS/GISDStan.htm
- [1] WAGIC Metadata
  - http://wagic.wa.gov/techstds2/wl_subsetv1.htm
- Geospatial One Stop
  - http://www.geo-one-stop.gov/Standards/Base/index.html

APPENDIX – A

Related Route Type (RRT)

Before the **Tr**ansportation **I**nformation and **P**lanning **S**upport System (TRIPS), the State Route (SR) number represented the main traveled way of our highways. This left out other pieces of our highways like Ramps, Spurs, Couplets, etc. and in numerous cases, caused location data to be inaccurate.

With TRIPS came RRT and RRQ. Together with the SR number, these descriptors identify very precisely any piece of the highway system in the State.

RRT = A two character abbreviation for a type of roadway. The following is a list of RRTs in the system.

AR	Alternate Route	CD	Collector Distributor Dec
CO	Couplet	CI	Collector Distributor Inc
FD	Frontage Road Dec	LX	Crossroad within Interchange
FI	Frontage Road Inc	P1 - P9	Off Ramp, Inc
FS	Ferry Ship (Boat)	PU	Extension of P ramp
FT	Ferry Terminal	Q1 - Q9	On Ramp, Inc
PR	Proposed Route	QU	Extension of Q ramp
RL	Reversible Lane	R1 - R9	Off Ramp, Dec
SP	Spur	RU	Extension of R ramp
TB	Transitional Turnback	S1 - S9	On Ramp, Dec
TR	Temporary Route	SU	Extension of S ramp

Related Route Qualifier (RRQ)

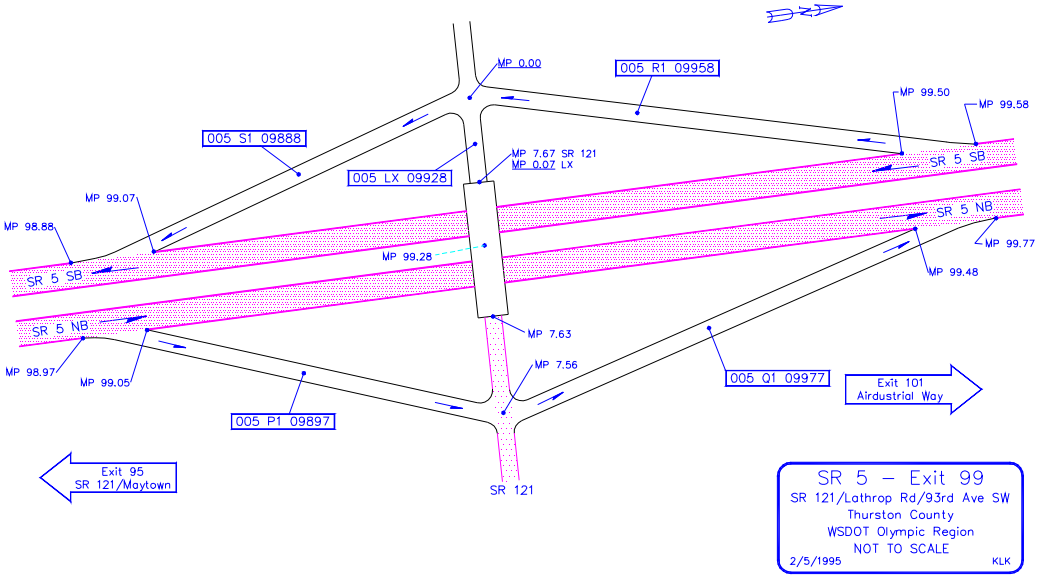
The RRQ is a six-digit field that uniquely identifies the RRT since there may be more than one of the same type of RRT for a route. The assigning of RRQ is done in one of three ways depending on the RRT.

(2) The following RRTs use the Mainline SRMP where the RRT attaches to the Mainline. The begin SRMP for that RRT will be 0.000.

CD	Collector Distributor Dec	P1 - P9	Off Ramp, Inc
CI	Collector Distributor Inc	PU	Extension of P ramp
FD	Frontage Road Dec	Q1 - Q9	On Ramp, Inc
FI	Frontage Road Inc	QU	Extension of Q ramp
LX	Crossroad within Interchange	R1 - R9	Off Ramp, Dec
RL	Reversible Lane **	RU	Extension of R ramp
		S1 - S9	On Ramp, Dec
		SU	Extension of S ramp

*** At this time, this RRT does not follow standard naming convention*

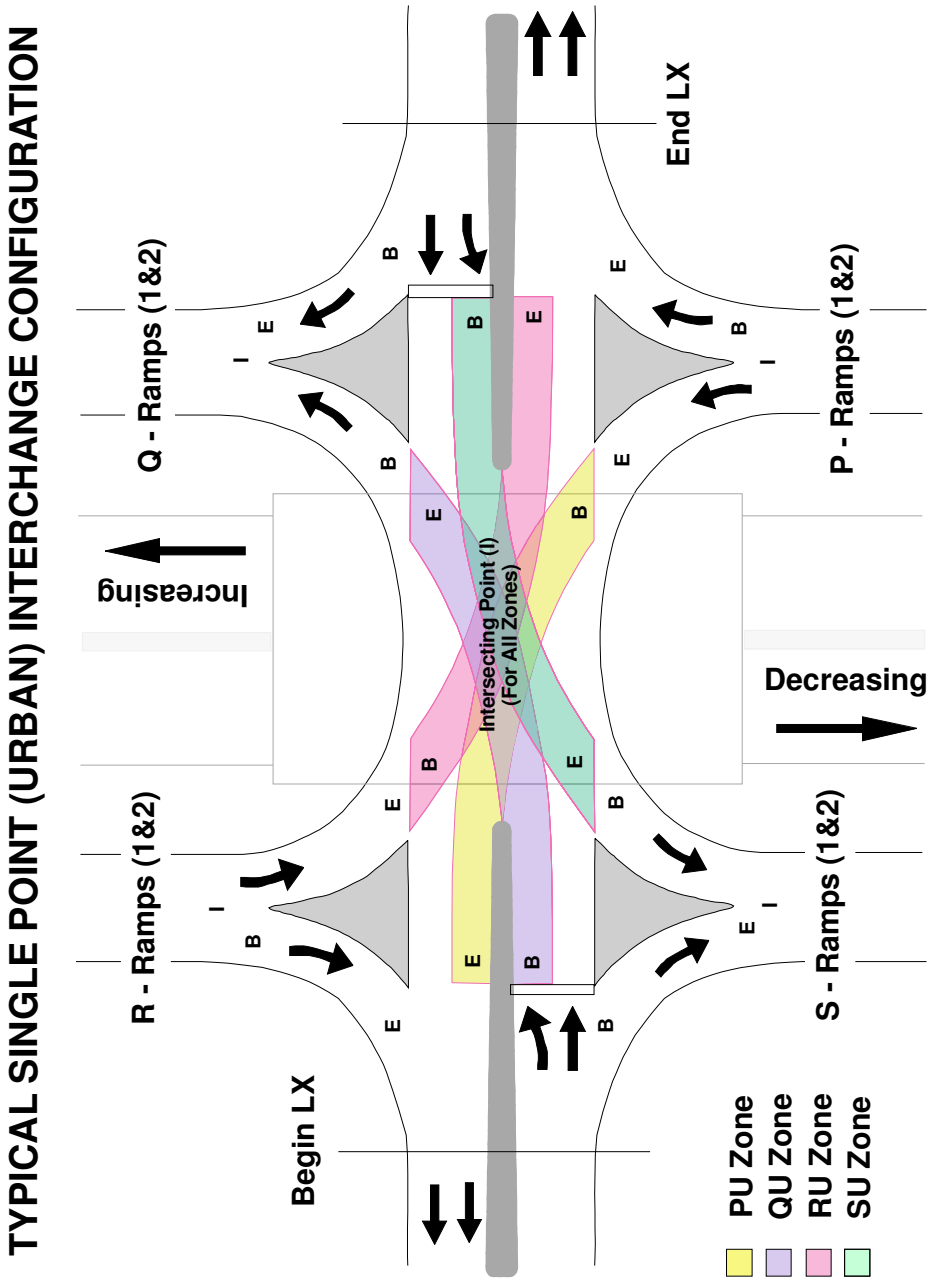
Diamond Exchange Example



EXAMPLE: 005 R1 09958

Where:	005	=	SR Number
	R1	=	RRT for decreasing MP direction off-ramp (R ramp)
	09958	=	Mainline SRMP at beginning of the R ramp where the R ramp leaves the mainline

Typical Single Point (Urban) Interchange Configuration



EXAMPLE: 101 RU 36542

Where:	005	=	SR Number
	RU	=	RRT for extension of R ramp to LX tangent
	36542	=	Mainline SRMP at beginning of the R ramp where the R ramp leaves the mainline

APPENDIX – B

This section contains data, data standards, or possible data issues that have not been formalized, approved, or researched. Some or all of the items in this section may never be approved, but are included so that the ideas do not get lost until formally reviewed. There will be two sections, where data issues will be documented, the "Park and Ride" and the "Dry Dock".

Items in "Park and Ride" are on the front burner and will be research and formalized for review and likely be placed in the standards as soon as an adequate review has occurred.

Items in the "Dry Dock" have been identified as possible data, but have not been identified as being needed for WA-Trans, or have not had the researched necessary to indicate enough value to be placed in the "Park and Ride". An example would be the attributes used by Federal Railroad Administration (FRA) in their record keeping, but not identified as necessary by WA-Trans partners.

Although it is possible that data issues in these two sections will never be used in WA-Trans, it is considered important that this data not be lost while waiting for a final determination.

Park and Ride

Retire Segments/Points

The Business Rules related to retiring a segment have not been defined. The Retire Date has a definition, but the process involved in retiring a segment or Reference Point has not been defined.

Date attributes in some tables.

All entities need to be checked and a determination made as to whether date attributes need to be added. Date attributes do need to be added to addressing. In some cases the lack of dates may be due to the entity research not being complete.

Freight and Goods

Freight and Goods data has been identified as necessary for WA-Trans. The basic Freight and Goods designations can be added and identified with each segment without much effort, but there is more data and the scope of Freight and Goods data in WA-Trans has not been determined.

The basic Freight and Goods tonnage designations:
T-1: more than 10 million tons per year
T-2: 4 million to 10 million tons per year
T-3: 300,000 to 4 million tons per year
T-4: 100,000 to 300,000 tons per year
T-5: at least 20,000 tons in 60 days

The designations are determined by one of three calculations. One of the calculations can be used with only basic ADT data (ADT and percentage of trucks). ADT data will be included in WA-Trans and information on ADT is included in this appendix.

ADT (Average Daily Traffic)

The average daily traffic is considered essential data for WA-Trans users. Where and how much of this data will be included in WA-Trans has not been determined at this time. The basic minimum data that will likely be included will be:

- ADT (Average Daily Traffic) – Number of cars and trucks counted at a given point, or interpolated for a point expressed as an integer. Whether this data is applied to Reference Points, Segments or both has not been determined.
- Percent of Trucks – Percentage of ADT that has been counted as truck traffic, expressed as an integer.

Adding ADT data in a manner where it can be used for Freight and Goods calculations has not been explored. This relationship may not be considered important.

Required Entities

Many of the attributes in WA-Trans will be required. There will be two data stores for WA-Trans, the Working Storage where data is being translated and manipulated, and the final storage the WA-Trans production database. Each data storage will need to have a slightly different structure and many of the attributes, which will need to have a data value other than NULL, will eventually get this value in various ways during the various processes needed to update WA-Trans with provider data.

The decision to make an attribute required in the WA-Trans database is based on the phrase "Does WA-Trans want this entity to have a value other than NULL?". If the answer is yes then how is this data going to be obtained? It is recognized that some data providers may not have some of the data, or even collect data WA-Trans considers important. There will then need to be processes to assist the user or software/backend processes to calculate or add a default value to a required field.

WA-Trans is currently creating a document indicating which attributes will be required. The data being documented includes:

- Entity Name,
- Attribute Name,
- Is it required in Working Storage,
- Is it required in the WA-Trans database,
- Notes on how a value may be obtained through WA-Trans processes (e.g. software interface prompts, calculations, Geo-processing calculations, back end processing in the database)

During the determination of required attributes it will also be necessary to determine relationships between attributes.

It is understood that many data attributes and their character will likely change as research continues. It is also considered important that those attributes, identified as needing to be required, have the required attribute initiated as we progress and learn instead of being initiated across the board at the beginning.

Functional Classification Crosswalk

There are several different flavors of Transportation Classification Systems used by various organizations.

- The Bureau of Indian Affairs (BIA),
- USGS (particularly related to The National Map),
- Census (they have two, one old and being phased out being replaced by another),
- Federal Functional Class (USDOT).

The Federal Functional Class is the one considered the most important and we would like to be able to obtain this from any other given functional class. To this end a Functional Class Crosswalk has been proposed. The table below is a draft of a functional Class Crosswalk. NOTE: There will need to be adjustments to some of the items.

Fed_Func_Cls_Surr_Key	Fed_Func_Cls_Descr	Fed_Func_Cls_Cd	St_Func_Cls_Cd	USGS	BIA	CFCC (Census)	MTFCC (Census)
1	Rural-Interstate	1	R5	Class 1	Class 2	A1-A18, A21-A28	S1100
2	Rural-Principal-Arterial	2	R1	Class 1	Class 2	A21-A28, A31-A38	S1100
3	Rural-Minor-Arterial	6	R2	Class 1	Class 2	A31-A38	S1200
4	Rural-Major-Collector	7	R3	Class 1	Class 2	A31-A38	S1200
5	Rural-Unclassified	9	R4	Class 2	Class 3	A41-A48	S1400
6	Urban-Interstate	11	U5	Class 1	NA	A1-A18, A21-A28	S1100
7	Urban-Principal-Arterial	12	U1	Class 1	NA	A21-A28, A31-A38	S1100
8	Urban-Other-Principal-Arterial	14	U1	Class 1	NA	A31-A38	S1100
9	Urban-Minor-Arterial	16	U2	Class 1	NA	A21-A28, A31-A38	S1200
10	Urban-Collector	17	U3	Class 1	NA	A41-A48	S1200
11	Urban-Unclassified	19	U4	Class 2	NA	A41-A48, A51-A53, A60-A65, A70-A74	S1400
12	Rural-Minor-Collector	8	NULL	Class 2	Class 4	A41-A48, A51-A53, A60-A65, A70-A74	S1400
	NA	NA	NA	Class 3	Class 3, Class 4	A41-A48, A51-A53, A60-A65, A70-A74	S1200, S1400
	NA	NA	NA	Class 4	Class 3	A71-A74	S1400, S1500
	NA	NA	NA	Class 5	Class 5	A71-A74	S1500, S1710, S1730, S1740, S1750, S1780,S1820, S1830

Possible Domains

Entities where Domains have not been fleshed out yet include:

- Reference Point Type
- Mode Type
- Structure Type
- Surface Type
- Functional Class
- Segment Status Type
- Object Code
- Status
- Event Type
- Track Class

City Identifiers FIPS vs County

WA-Trans stores the FIPS City identifiers related to segment descriptions and reference points. The source of the city identifiers are from the data providers files that will be translated to WA-Trans. A problem is encountered during translation with FIPS city identifiers due to the fact that some counties maintain their own city identifier within their data, which works very well for their purposes, but is not a FIPS Identifier.

It is clear there needs to be some process to convert the provided city identifiers to FIPS City identifiers. Crosswalk processes have been proposed. A basic requirement a crosswalk process will need to follow will be down one of two avenues.

1. The conversion to FIPS City identifier from the provided City Identifier must work going into WA-Trans and also during translation back out.
2. The conversion to FIPS City identifier need only work during translation into WA-Trans.

Option 1

This will require there be some process to convert the provided city identifier to a FIPS identifier and then to again refer to that process while supplying data for a user request.

Pros:

1. This process will maintain the city identifier, originally used within the specific counties application to identify a city, for any user accessing WA-Trans.

Cons:

A. A crosswalk will have to be maintained in WA-Trans independently of the data provider process. This could involve provider maintenance in addition to the periodic WA-Trans data updates.
B. A crosswalk will have to be maintained for every provider submitting data. This will at least include every county in the state.
C. The original provider city identifier will have little significance to the user without a description file and even then will be of less universal use than a FIPS City identifier.
D. If a data user was given a choice of receiving the original City ID or FIPS ID it would involve additional application development. This would also involve explaining the necessity of making that choice, pros and cons.

E. Developing application process for a data user will be quite extensive to take into account the possibility of multiple provider crosswalk data being accessed for a single data request.

Implementation:

This process could be implemented in two ways.

- One could be at the translation level alone with a file (e.g. a .cvs (Excel), or XML) file sitting at a known location being reference during translation processes.
- Second could be tables within WA-Trans that are referenced during translation processes.

Each implementation will require maintenance with the second one involving database processes as well as data maintenance. Application maintenance will also be involved with processes for a data user requests in addition to the initial translation to WA-Trans.

Option 2

This will require there be some process to convert the provided city identifier to a FIPS City identifier.

Pros:

1. This process will only need to be maintained for initial translation into WA-Trans and not during any other data processes.
2. With good design it may be possible to create the process to download the original city identifier at a later date.

Cons:

A. A crosswalk will have to be maintained in WA-Trans independently of the data provider process. This could involve provider maintenance in addition to the periodic WA-Trans data updates.

B. A crosswalk will have to be maintained for every provider submitting data. This will at least include every county in the state.

C. The original City identifier will be lost during the translation process and not available during user download.

Implementation:

This process could be implemented in two ways.

- One could be at the translation level alone with a file (e.g. a .cvs (Excel), or XML) file sitting at a known location being reference during translation processes.
- Second could be tables within WA-Trans that are referenced during translation processes.

Each implementation will require maintenance with the second one involving database processes as well as data maintenance.

FIPS-City Identifier Crosswalk

Below is a proposed Crosswalk for use as a database table or a data file. This crosswalk only includes King and Pierce County City Codes.

County	City/Town	WSDOT County #	FIPS City	OFM Long City	FIPS County	Local City Identifier
King	Algona	17	01290	5301290WA	033	AL
King	Auburn (pt)	17	03180	5303180WA	033	AU
King	Beaux Arts Village	17	04895	5304895WA	033	BA
King	Bellevue	17	05210	5305210WA	033	BE
King	Black Diamond	17	06330	5306330WA	033	BD
King	Bothell (pt)	17	07380	5307380WA	033	BO
King	Burien	17	08850	5308850WA	033	BU
King	Carnation	17	10215	5310215WA	033	CA
King	Clyde Hill	17	13365	5313365WA	033	CH
King	Covington	17	15290	5315290WA	033	CO
King	Des Moines	17	17635	5317635WA	033	DM
King	Duvall	17	19035	5319035WA	033	DU
King	Enumclaw	17	22045	5322045WA	033	EN
King	Federal Way	17	23515	5323515WA	033	FW
King	Hunts Point	17	32755	5332755WA	033	HP
King	Issaquah	17	33805	5333805WA	033	IS
King	Kenmore	17	35170	5335170WA	033	KM
King	Kent	17	35415	5335415WA	033	KE
King	Kirkland	17	35940	5335940WA	033	KI
King	Lake Forest Park	17	37270	5337270WA	033	LF
King	Maple Valley	17	43150	5343150WA	033	MV
King	Medina	17	44725	5344725WA	033	ME
King	Mercer Island	17	45005	5345005WA	033	MI
King	Milton (pt)	17	46020	5346020WA	033	MT
King	Newcastle	17	48645	5348645WA	033	NE
King	Normandy Park	17	49415	5349415WA	033	NP
King	North Bend	17	49485	5349485WA	033	NB
King	Pacific (pt)	17	52495	5352495WA	033	PA
King	Redmond	17	57535	5357535WA	033	RM
King	Renton	17	57745	5357745WA	033	RN
King	Sammamish	17	61115	5361115WA	033	SM
King	SeaTac	17	62288	5362288WA	033	ST
King	Seattle	17	63000	5363000WA	033	SE
King	Shoreline	17	63960	5363960WA	033	SH
King	Skykomish	17	64855	5364855WA	033	SK
King	Snoqualmie	17	65205	5365205WA	033	SN
King	Tukwila	17	72625	5372625WA	033	TU
King	Woodinville	17	79590	5379590WA	033	WO
King	Yarrow Point	17	80150	5380150WA	033	YP
Pierce	Anderson Island	27			053	AI
Pierce	Auburn (pt)	27	03180	5303180WA	053	AU
Pierce	Bonney Lake	27	07170	5307170WA	053	BL
Pierce	Buckley	27	08570	5308570WA	053	BU
Pierce	Carbonado	27	09970	5309970WA	053	CA

Pierce	DuPont	27	18965	5318965WA	053	DU
County	**City/Town**	**WSDOT County #**	**FIPS City**	**OFM Long City**	**FIPS County**	**Local City Identifier**
Pierce	Eatonville	27	20260	5320260WA	053	EA
Pierce	Edgewood	27	20645	5320645WA	053	EW
Pierce	Fife	27	23795	5323795WA	053	FF
Pierce	Fox Island	27			053	FI
Pierce	Fort Lewis	27			053	FL
Pierce	Fircrest	27	23970	5323970WA	053	FR
Pierce	Gig Harbor	27	26735	5326735WA	053	GH
Pierce	Heron Island	27			053	HI
Pierce	King County	27	033		053	KC
Pierce	Lakewood	27	38038	5338038WA	053	LD
Pierce	McCord AFB	27			053	MC
Pierce	Milton (pt)	27	46020	5346020WA	053	ML
Pierce	Orting	27	52005	5352005WA	053	OR
Pierce	Pierce County	27			053	PC
Pierce	Pacific (pt)	27	52495	5352495WA	053	PF
Pierce	Puyallup	27	56695	5356695WA	053	PY
Pierce	Raft Island	27			053	RI
Pierce	Roy	27	60160	5360160WA	053	RY
Pierce	Ruston	27	60510	5360510WA	053	RU
Pierce	South Prairie	27	66045	5366045WA	053	SO
Pierce	Steilacoom	27	67770	5367770WA	053	SM
Pierce	Sumner	27	68435	5368435WA	053	SU
Pierce	Tacoma	27	70000	5370000WA	053	TA
Pierce	University Place	27	73465	5373465WA	053	UP
Pierce	Wilkeson	27	78925	5378925WA	053	WI

Dry Dock

The Federal Railroad Administration (FRA) gathers data on railroads. We are not sure if this data will be added to Wa-Trans.

Rail Crossing		Contains data related to the class of a rail line
RailCrossingID	INTEGER	Surrogate Key. Sequential number auto-generated by the database upon insertion of a record. Used to uniquely identify a Rail Crossing record within the database.
(R) Rail Crossing Code	CHAR(1)	A 1-letter code assigned to RailCrossing
(R) Rail Crossing Description	VARCHAR(50)	Narrative description of the one character code, which describes the Rail Crossing.

- **Crossing Number** (6-digits followed by an alpha character).
- **Crossing Owner (Railroad or Company name)**
- **Crossing Surface (on main line)**
- **Is Crossing Illuminated?**
- **Quiet Zone (and times of effect)**
- **Type of Passenger Service (over crossing) –** Domain
    - **AMTRAK** only
    - **AMTRAK and Other** (commuter, tourist, etc.)
    - **Other**, including commuter, tourist, etc.
    - **None** (no passenger service)